George W. Quelch

CATALOGUE

OF

ARCHITECTS', ENGINEERS'

AND

DRAUGHTSMEN'S SUPPLIES.

F. WEBER & CO.

PHILADELPHIA.

Branch Houses:

ST. LOUIS. BALTIMORE.

ERRATA.

Page 168, Sphinx Pencil Rubber, the number should be 5525 instead of No. 5025.

Page 215, Italic lines should read, For General Description see pages 218-220.

Page 8, Major Paper No. 3092 should read Medium instead of Thin.

Page 3, Patent Office Bristol Board No. 3017, price per dozen should be 80 cents instead of 70 cents.

Page 74, Hairspring Divider No. 3903, price should be $1.50 instead of 70 cents.

Page 131, Hard Rubber T-Square, number should be 5021 instead of No. 5025.

Page 136, Bars for Beam Compasses, cut numbers should be 5038-5039-5040 instead of Nos. 5058-5059-5060.

Page 182, Le Paige's Glue, prices of sizes should be vice-versa.

Page 199, Color Cups No. 6000, price for one inch diameter should be 2 cts. instead of 1 ct.

Page 205, Hand Level No. 6165, price should be $15.00 instead of $9.00.

Page 205, Abney Hand Level, cut number should be 6170 instead of No. 6165.

VOL. 111. ESTABLISHED 40 YEARS.

Illustrated Price List

OF

ARCHITECTS', ENGINEERS' AND DRAUGHTSMEN'S SUPPLIES.

F. WEBER & CO.

(Successors to JANENTZKY & WEBER.)

MANUFACTURERS AND IMPORTERS,

1125 Chestnut Street,

PHILADELPHIA.

BRANCH HOUSES:

918 OLIVE STREET, ST. LOUIS, MO.

5 N. CHARLES STREET, BALTIMORE, MD.

Introduction.

After a number of years' experience in the Drawing Material line, we to-day point with great pleasure to the fact, that we publish in this number, Volume 110, a Catalogue devoted entirely to **Architects', Engineers' and Draughtsmen's Supplies**, which in arrangement, extensive and detailed illustrations, and for complete description of every article in this branch of our business, excels all former efforts in this direction.

This edition is the first one published by us apart from our line of Artist's Materials, which is represented by an independent Catalogue. A new arrangement is made in this issue, by which each and every article described is arranged in a consecutive form and numbered, in order that our patrons may have a most convenient way of ordering, and at the same time will make this Catalogue a valuable reference book for every drawing room. Many new specialties are included and described in this list, which has been re-arranged, the greater part rewritten, and all prices revised, a careful perusal of the same will be therefore advisable and advantageous.

We beg to draw particular attention to our special lines of Mathematical Instruments for School, Manual Training and College use, and wish to state that we carry a large stock on hand to meet any demand. The Riefler's Instruments have gradually gained such a reputation through their convenient form and excellent quality and construction, that they are preferred now to the old style by every draughtsmen that has used them.

In conclusion, we beg to state that all the goods we sell we warrant to be made of the very best materials accompanied with the best manner of workmanship, and will endeavor to maintain the reputation and merit, which we have so long enjoyed.

Respectfully,

F. WEBER & CO.

December, 1895.

Notice

The prices in this Catalogue will be strictly adhered to, deviations emanating only from fluctuations in the market values.

In ordering any of the materials enumerated in this Catalogue, it will be necessary only to state the number of each article, unless the number represents more than one size or grade of this respective article.

Parties not known to the firm must send satisfactory references or cash with order.

Articles to be sent C. O. D. require a sufficient sum of money to cover freight charges both ways in case of non-acceptance.

Remittance should be made by Bank Draft or P. O. Money Order payable to the firm. Bank Notes can be safely sent by registered mail or express. For smaller amounts postage stamps will be accepted.

All goods are packed with the utmost care, and no allowance will be made for damage during transit.

Articles can be sent by mail for one cent. per ounce to any part of the United States or Canada, provided the packages do not exceed four pounds each.

All claims must be made within five days after receipt of goods.

Packing cases will be charged at cost.

DRAWING PAPERS.

3000

WHATMAN'S HAND MADE.

EXPLANATION OF SURFACES.

"H. P." signifies Hot Pressed, and has a smooth surface. Mostly used for Pen and Pencil Drawing.

"N." signifies Cold Pressed, and has a finely grained surface. Mostly used for Pencil Drawing and Water-color Painting.

"R." signifies Rough, and has a coarsely grained surface. Used for bold Water-color Painting.

	Size.	Per Sheet.	Per Quire.
Cap, H. P. and N.	13 x 17 inches	$ 04	$ 65
Demy, H. P. and N.	15 x 20 "	05	1 00
Medium, H. P. and N.	17 x 22 "	08	1 35
Royal, H. P., N. and R.	19 x 24 "	10	1 75
Super-Royal, H. P. and N.	19 x 27 "	12	2 25
Imperial, 72 lbs. per ream, H. P., N. and R.	22 x 30 "	14	2 75
Atlas, H. P. and N.	26 x 34 "	20	4 25
Double Elephant, H. P., N. and R.	26 x 40 "	25	5 00
Antiquarian, H. P. and N.	31 x 52 "	1 25	24 00

Special Prices in Ream Lots.

3001

WHATMAN'S EXTRA HEAVY.

SELECT.

	Size.	Per Sheet.	Per Quire.
Imperial, 90 lbs. per ream, H. P., N. and R	22 x 30 inches	$ 20	$ 4 25
" 140 " " H. P., N. and R.	22 x 30 "	30	6 50
" 300 " " N.	22 x 30 "	80	
Double Elephant, 260 lbs. per ream, N.	26 x 40 "	75	

3002

MOUNTED WHATMAN'S PAPER.

	Size.	Per Sheet.	Per Quire.
Royal	19 x 24 inches	$ 35	$ 7 50
Imperial	22 x 30 "	45	10 00
Double Elephant	26 x 40 "	70	16 50
Antiquarian	31 x 52 "	1 80	

3003 **"COLUMBIA" DRAWING PAPER.**

AN EXCELLENT SUBSTITUTE FOR WHATMAN'S PAPER.

Weight, about 20 per cent. heavier than Whatman's. Each sheet is stamped with our Trade Mark and the name "Columbia."

Made Hot Pressed, "H. P." or smooth surface, and Cold Pressed, "N." or fine-grained surface.

	Size.	Per Sheet.	Per Quire.
Royal	19 x 25 inches	$ 08	$ 1 60
Super-Royal	19 x 27 "	10	1 80
Imperial	22 x 31 "	12	2 25
Double Elephant	28 x 40 "	20	4 25

Sample Book of Drawing Papers on Application.

3005 **"COSMOS" GERMAN DRAWING PAPER.**

FIRST QUALITY.

This paper is of good quality, with a fine grain and well sized, it is especially adapted for use in colleges and schools.

	Size.	Per Sheet.	Per Quire.
Cap	13 x 17 inches	$ 02	$ 30
Demy	15 x 20 "	03	45
Medium	17 x 22 "	04	60
Royal	19 x 24 "	06	75
Super-Royal	19 x 27 "	08	90
Imperial	22 x 30 "	10	1 15
Double Elephant	26 x 42 "	16	2 25

Special Prices in Ream Lots.

3007 **GERMAN DRAWING PAPER.**

SECOND QUALITY.

	Size.	Per Sheet.	Per Quire.
Cap	14 x 17 inches	$ 01½	$ 25
Demy	15½ x 19 "	02	40
Medium	17 x 22 "	03	55
Royal	19 x 24 "	05	65
Super-Royal	19 x 27 "	06	75
Imperial	22 x 30 "	08	95
Double Elephant	26 x 40 "	12	1 80

Special Prices in Ream Lots.

3010

CRESWICK PAPER.

ROUGH AND COLD PRESSED.

	Size.	Per Sheet.	Per Quire.
Imperial, extra stout	22 x 30 inches	$ 30	$ 6 50
Double Elephant, extra stout	26 x 40 "	60	12 50

3012

"SPHINX" DRAWING PAPER.

A Light Buff Detail Paper, well sized and of excellent erasing quality.

	Size.	Per Sheet.	Per Quire.
Double Elephant	27 x 40 inches	$ 15	$ 2 50

3014

REYNOLDS' ENGLISH BRISTOL BOARDS.

SUPERFINE QUALITY.

Size.	Two Sheets. Per Sheet.	Two Sheets. Per Doz.	Three Sheets. Per Sheet.	Three Sheets. Per Doz.	Four Sheets. Per Sheet.	Four Sheets. Per Doz.
Cap 12 x 15 inches	$ 06	$ 55	$ 08	$ 85	$ 10	$1 10
Demy 14 x 18 "	08	85	12	1 25	16	1 65
Medium 16½ x 21 "	12	1 15	16	1 70	22	2 30
Royal 18 x 22 "	15	1 40	22	2 25	30	2 90
Imperial 20½ x 28 "			45	4 25	55	5 75

3015

DOMESTIC BRISTOL BOARDS.

	Size.	Per Sheet.	Per Doz.
2 sheets	22 x 28 inches	$ 10	$ 1 00
3 "	22 x 28 "	15	1 50
4 "	22 x 28 "	25	2 50

3016

PATENT OFFICE BRISTOL BOARDS.

Size.	Each.	Per Doz.	Per Gross.
3 sheets, 10 x 15 inches, blank	$ 06	$ 60	$ 6 50
3 " 15 x 20 " "	12	1 20	13 00

3017

THE SAME PRINTED WITH BORDER.

Size.	Each.	Per Doz.	Per Gross.
3 sheets, 10 x 15 inches	$ 07	$ 70	$ 8 65

3020 ILLUSTRATORS' SKETCHING TABLETS.

Faced with Steinbach's or Whatman's Paper, Cold Pressed.

Sizes, inches	11 x 14	15 x 22	19 x 25	22 x 28	25 x 38
Steinbach	each, $ 15	$ 25	$ 35	$ 40	$ 60
Whatman	" 15	25		40	

3021 TURNBULL'S LONDON BOARDS.

ABRADED AND ROUGH SURFACE.

Faced with Whatman's Paper.

	Size.		3 Sheets.	4 Sheets.
Demy	14 x 18 inches	each,	$ 30	$ 40
Medium	16½ x 21 "	"	40	50
Royal	18 x 22 "	"	50	65
Imperial	20 x 28 "	"	1 00	1 35

3023 ENGLISH PARCHMENT.

BEST QUALITY.

Size.	Per Sheet.	Per Doz.
14 x 18 inches	$ 50	$ 5 50
16 x 20 "	70	7 20
18 x 24 "	90	9 00

3024 VELLUM PAPER.

	Size.	Per Sheet.	Per Quire.
Light	22 x 34 inches	$ 35	$ 6 75
Heavy	22 x 34 "	50	10 00

3026 MOUNTING BOARDS.

	Size.	Per Sheet.	Per Doz.
3 ply, white	22 x 28 inches	$ 10	$1 00
4 " "	22 x 28 "	15	1 50
6 " "	22 x 28 "	22	2·25
6 " "	25 x 35 "	35	3 50
6 " "	30 x 40 "	60	6 00
3 " tinted, buff and gray	22 x 28 "	15	1 50
4 " " " " "	22 x 28 "	22	2 25

THE "ACME" MOUNTING BOARD.

A Cheap Board for Ordinary Mounting Purposes.

		Size.	Per Sheet.	Per 100 Sheets.
3028	6 ply	22 x 28 inches	$ 08	$ 6 00
3029	8 "	22 x 28 "	10	8 00
3030	10 "	22 x 28 "	12	10 00

SHAGREEN WATER-COLOR BOARDS.

EGG-SHELL SURFACE, FOR WATER-COLOR PAINTING AND FANCY WORK.

White, Buff, Gray and Blue. The White is also made in Torchon and Egg-shell Surface.

		Size.	Per Sheet.	Per 100 Sheets.
3032	Thin	22 x 34 inches	$ 15	$12 00
3033	Thick	22 x 34 "	30	24 00

ARCHITECTS' WATER-COLOR OR MAT BOARDS.

Rough and Egg-Shell Surface, covered on both sides, either White and Gray or White and Buff, in three thicknesses.

	Sizes, inches	22 x 34	26 x 38	30 x 40	36 x 50
3035	Thick per sheet,	$ 15	$ 25	$ 30	$ 50
3036	Double thick "	25	35	40	75
3037	Treble thick "	35	50	60	1 00

Special Prices for Quantities.

3039

BLOTTING PAPER.

	Per Sheet.	Per Quire.
White, thin, size, 19 x 24	$ 05	$ 1 00
" thick " 19 x 24	08	1 50
Colored, " " 19 x 24	08	1 50

ROLL DRAWING PAPERS.

WHITE.

Full rolls will be sent unless 10-yard rolls are specially ordered.

"AJAX," German Drawing Paper, of medium quality, and very good for ordinary work.

		Per Yd.	Per 10 Yds.	Per Lb.
3040	**"AJAX,"** medium, fine grain.			
	30 inches wide, rolls of about 30 lbs.	$ 18	$1 40	$ 35
	36 " " " 30 "	20	1 60	35
	42 " " " 35 "	24	1 85	35
3041	**"AJAX,"** heavy.	Per Yd.	Per 10 Yds.	Per Lb.
	60 inches wide, rolls of about 40 lbs.	40	3 50	35

"JUNO," Linen Paper of excellent quality, fine grain finish, being well sized, and after erasing will stand ink and color perfectly well.

3045	**"JUNO,"** medium, fine grain.			
	36 inches wide, rolls of about 25 lbs.	25	2 25	45
	42 " " " 35 "	35	3 15	45
	54 " " " 30 "	45	4 00	45

"JUPITER" Papers possess extraordinary good qualities and can be highly recommended. They are of similar quality and finish as those called *"Paragon,"* *"Acme,"* and *"Peerless."*

3050	**"JUPITER,"** medium, egg-shell surface.			
	36 inches wide, rolls of about 35 lbs.	30	2 70	45
	42 " " " 35 "	35	3 25	45
	58 " " " 35 "	47	4 20	45
3051	**"JUPITER,"** medium, smooth surface.			
	42 inches wide, rolls of about 35 lbs.	35	3 25	45
	58 " " " 35 "	47	4 20	45
3052	**"JUPITER,"** light, egg-shell surface.			
	58 inches wide, rolls of about 35 lbs.	40	3 50	45
3053	**"JUPITER,"** heavy, egg-shell surface.			
	58 inches wide, rolls of about 35 lbs.	65	6 00	45

"TIGER," waterproof papers, and unequaled for their toughness, being very desirable for drawings requiring frequent handling.

3055	**"TIGER,"** medium, smooth.			
	62 inches wide, rolls of about 45 lbs.	40	3 50	40
3056	**"TIGER,"** heavy, smooth.			
	62 inches wide, rolls of about 45 lbs.	50	4 50	40

ROLL DRAWING PAPERS—Continued.

3058 **"ORION"** Bond Drawing Paper, a very strong and tough paper, suitable for general office work, and from which blue prints can be taken direct.

	Per Yard.	Per 50 Yards.
30 inches wide	12	3 30
36 "	15	4 00
42 "	18	4 70

STEINBACH'S, for crayon and solar printing.

3060	54 inches wide, thin, in 10, 25, 50 and 100-yard rolls	34
3061	54 " thick, 10, 25, 50 and 100-yard "	50

Original rolls of about 140 pounds at special prices.

MAT AND WATER-COLOR PAPER.

		Per Yard.	Per 10 Yards.	Per Lb.
3065	**"MINERVA,"** imitation of Whatman's Rough Surface. 58 inches wide, rolls of about 40 lbs.	$ 60	$5 50	$ 50
3066	**"VENUS,"** imitation of Whatman's Rough Surface. 58 inches wide, rolls of about 40 lbs.	45	4 00	45
3067	**"SHAGREEN,"** egg-shell surface. 54 inches wide, rolls of about 33 lbs.	35	3 00	45
3070	**"CLIO,"** tinted egg-shell surface. 58 inches wide, rolls of about 28 lbs.	40	3 50	45

"CLIO" is made in the following tints:

Tint No. 1, light buff. Tint No. 4, dark gray. Tint No. 7½, light gray.
Tint No 3½, very light buff. Tint No. 5, medium gray. Tint No. 8, dark gray.
Tint No. 3, light brown. Tint No. 7, light gray.

MOUNTED DRAWING PAPERS.

MUSLIN BACKED.

			Per Yd.	Per 10 Yds.
3075	**"AJAX,"** 36 inches wide		$ 70	$ 5 40
	" 42 "		85	6 80
	" 60 "		1 25	11 00
3078	**"JUNO,"** 36 "	medium	85	7 50
	" 42 "	"	1 00	8 75
	" 54 "	heavy	1 25	11 00
3080	**"JUPITER,"** 36 "	egg-shell, medium	90	7 50
	" 42 "	" "	1 00	8 85
	" 58 "	" "	1 40	11 75
3081	" 42 "	smooth, "	1 00	8 85
	" 58 "	" "	1 40	11 75
3082	" 58 "	egg-shell, light	1 25	11 25
3083	" 58 "	egg-shell, extra heavy	1 60	13 00
3085	**"TIGER,"** 62 "	thin, water-proof	1 40	12 50
3086	" 62 "	heavy, "	1 60	13 25

DETAIL DRAWING PAPERS.

3090 **"MANILLA"** Detail or Pattern Paper, buff, in rolls of 60 to 100 lbs., in the following thicknesses and widths . . . . . per pound, $ 10

Inches wide		36	42	48	54
X, Thin	Per yard	$ 05	$ 06		
	" 10 yards,	40	50		
XX, Medium	Per yard	07	09	$ 12	$ 14
	" 10 yards,	60	75	1 00	1 20
XXX, Thick	Per yard	09	12	14	16
	" 10 yards,	75	1 00	1 20	1 40

"MAJOR," Detail Paper, 36, 42, 54 inches wide, light buff, extra fine quality, dull finish, medium thick, in rolls of 75 to 100 lbs. . per pound, $ 12

Inches wide		36	42	54
3092 Thin	per yard	$ 06	$ 08	
	" 10-yard roll	50	70	
	" 50 " "	2 00	2 50	
	"100 " "	3 75	4 50	
3093 Heavy	per yard	08	10	$ 15
	" 10-yard roll	65	80	1 30
	" 50 " "	2 50	3 00	4 00
	"100 " "	4 50	5 50	7 20

"SPHINX," a detail drawing-paper of superior quality, stands erasing perfectly well.

		Per Yard.	Per 10 Yards.	Per Lb.
3094	**"SPHINX,"** light buff.			
	36 inches wide, rolls of about 30 lbs.	$ 12	$1 10	$ 25
	42 " " " " "	15	1 40	25
	54 " " " " "	20	1 80	25
3095	**"SPHINX,"** dark buff.			
	36 inches wide, rolls of about 30 lbs	12	1 10	25
	42 " " " " "	15	1 40	25
	54 " " " " "	20	1 80	25

3100 **"UTILITY"** Tracing and Detail Paper is especially adapted for rough sketching and can also be used as a tracing paper.

	Per Yard.	Per 50 Yards.
30 inches wide	$ 08	$1 80
36 " "	10	2 25
42 " "	12	2 75

TRACING PAPERS.

IN SHEETS.

			Per Sheet.	Per Quire.
3105	**"TAURUS,"** unprepared.			
	Super-Royal	20 x 27 inches	$ 05	$1 00
	Double Elephant	27 x 40 "	10	2 00
3107	**"APOLLO,"** thin vegetable.			
	Demy	14 x 19 inches	04	50
	Super-Royal	19 x 28½ "	06	80
3108	**"APOLLO,"** heavy vegetable.			
	Double Elephant	27 x 40 inches	10	2 00

TRACING PAPERS—Continued.

3110	**"DIANA,"** vegetable. French.			
	Cap	13 x 17 inches	$ 05	$ 75
	Royal	19 x 24 "	10	2 00
	Double Elephant	28 x 42 "	50	9 00
3112	**"PLATO,"** superior prepared.			
	Super-Royal	20 x 28 inches	10	2 00
	Double Elephant	28 x 40 "	20	3 50
3114	**"PARCHMENT"** Paper, very tough.			
	18 x 24		06	1 25

TRACING PAPERS.

IN ROLLS OF CONTINUOUS LENGTH.

		50 Yards.	100 Yards.
3116	**"FORTUNA,"** buff tint, unprepared.		
	40 inches wide, per roll	$1 50	$2 50
	48 " " "	2 00	3 25

"TAURUS," unprepared, in rolls of 44 yards

		Per Yard.	Per Roll.
3118	Unglazed, 57 inches wide	$ 20	$5 00
3119	Glazed, 57 inches wide	20	5 00
3120	**"APOLLO,"** vegetable, light, in rolls 20 yards.		
	28½ inches wide	10	1 20
	43 " "	15	1 50
3121	**"APOLLO,"** vegetable, heavy, in rolls of 20 yards.		
	43 inches wide	18	2 00
	57 " "	20	2 50
3124	**"DIANA,"** vegetable, French, in rolls of 20 yards.		
	43 inches wide	18	2 25
3126	**"MARS,"** prepared, in rolls of 20 yards.		
	40 inches wide	25	3 50
3127	**"PLATO,"** superior prepared, in rolls of 20 yards.		
	Dull on one side and Glazed on the other.		
	58 inches wide	30	4 50

PARCHMENT DRAWING AND TRACING PAPERS.

Very Tough and Transparent, in Rolls of 20 Yards.

"HERCULES." This Paper can be either used as a Tracing or Drawing Paper. It possesses to the highest degree the properties of the latter. Owing to its transparency, copies of the Blue-print Process can be produced *direct*, *clear* and *distinct*, thus avoiding the time-losing method of tracing paper.

		Per Yard.	Per Roll.
3130	Thin, 39 inches wide	$ 18	$2 50
3131	Medium, 39 inches wide	25	3 25
3132	Heavy, 39 inches wide	30	3 75

TRACING CLOTHS.

3135

IMPERIAL.

Glazed on one side and Dull on the other

	Per Yard.	Per Roll.
30 inches wide, in rolls of 24 yards	$ 35	$ 6 90
36 " " " " 24 "	40	7 60
42 " " " " 24 "	50	10 50
54 " " " " 24 "	75	15 00

3137

DOWSE'S.

Glazed on one side and Dull on the other.

	Per Yard.	Per Roll.
30 inches wide, in rolls of 24 yards	$ 30	$6 20
36 " " " " 24 "	35	7 20
42 " " " " 24 "	45	9 50

3139

RELIANCE.

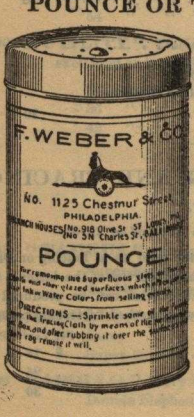
Glazed on one side and Dull on the other.

	Per Yard.	Per Roll.
30 inches wide, in rolls of 24 yards	$ 30	$6 00
37 " " " " 24 "	35	7 00
40 " " " " 24 "	40	8 40
43 " " " " 24 "	45	9 80

This is a heavier Cloth than the Imperial.

3140

POUNCE OR TRACING CLOTH POWDER.


F. WEBER & CO.
No. 1125 Chestnut Street,
PHILADELPHIA.
BRANCH HOUSES { No. 918 Olive St. ST. LOUIS, MO.
No. 314 Charles St. BALTIMORE, MD.
POUNCE.
For removing the superfluous gloss on Tracing Cloth and other glazed surfaces which often prevents Ink or Water Colors from setting evenly.
DIRECTIONS.—Sprinkle some of the Pounce on the Tracing Cloth by means of the muslin bag and after rubbing it over the surface with a rag remove it well.

For removing the superfluous gloss on Tracing Cloth and other glazed surfaces which often prevents Ink and Water Colors from setting evenly.

Per Box . . . . . $ 15

3142 **TRANSFER PAPERS.**

	Size.	Per Sheet.	Per Doz.
Blue	18½ x 23 inches	$ 10	$ 75
Red	18½ x 23 "	10	75
Black	18½ x 23 "	10	75
White	18½ x 23 "	10	75
Yellow	18½ x 23 "	10	75
Black, prepared on both sides	18½ x 23 "	15	1 50

3144 **AGATE STYLUS.**

For Manifold Writing and tracing Drawings.

	Each.	Per Doz.
Agate, in metal ferrules with ebony handle	$ 20	$2 00
" pocket, reversib'e metal tubes	30	3 00
Glass point, metal ferrule	12	1 20

TUBES FOR PRESERVING DRAWINGS.

	Length in inches	24	30	36	42
	Diameter in inches	3½	3½	3½	3½
3145	Metal, each	$1 20	$1 40	$1 50	$1 75
	Diameter in inches	2½	2½	2½	2½
3146	Paste Board, each	10	10	10	15

BLUE PRINT PAPERS.

PREPARED AND UNPREPARED.

"SUN," "ECLIPSE," "NEPTUNE," "STAR."

Our Blue Print Papers are unexcelled for quality. They are well sized and calendered to take the preparation evenly on the surface only. Our "ECLIPSE" brand differs from the "SUN" through the superior quality of stock used in its manufacture.

The "STAR" is a medium thin, strong linen paper, which stands a great deal of rough handling. The "NEPTUNE" are parchment papers, well known for toughness.

BLUE PRINT PAPERS—Continued.

Your special attention is drawn to the fact that all our Blue-Print Papers and Linen are always prepared fresh on receipt of order; and we use only the purest chemicals.

The improved style of packing which we adopted recently, will keep the paper air-tight, it being thus kept fresh for an unusually long time.

"SUN" HEAVY.

	Widths in inches	27	30	36	42
3160	Prepared, 10-yard roll	$ 90	$1 00	$1 15	$1 30
3162	" 50 " "	4 00	4 35	5 00	5 75
3163	Unprepared 50-yard roll	2 70	3 00	3 65	4 30
	" 50 " " 54 inches wide				5 65

"ECLIPSE" MEDIUM.

	Widths in inches	27	30	36	42
3170	Prepared, 10-yard roll	$ 80	$ 90	$1 00	$1 15
3172	" 50 " "	3 50	3 75	4 30	5 00
3173	Unprepared, 50-yard roll	2 30	2 60	3 20	3 80
	" 50 " " 54 inches wide				5 00

"ECLIPSE" HEAVY.

	Widths in inches	27	30	36	42
3180	Prepared, 10-yard roll	$1 00	$1 10	$1 25	$1 40
3182	" 50 " "	4 40	4 70	5 50	6 30
3183	Unprepared, 50-yard roll	3 30	3 60	4 40	5 20
	" 50 " " 54 inches wide				6 80

"STAR."

	Widths in inches	30	36	42
3190	Prepared 10-yard roll	$ 70	$ 80	$ 90
3192	" 50 " "	3 00	3 30	3 60
3193	Unprepared 50-yard roll	1 75	2 00	2 35

"NEPTUNE" THIN.

Excellent for Mailing Purposes.

	Widths in inches	30	36	42
3200	Prepared, 10-yard roll	$ 80	$ 90	$1 00
3202	" 50 " "	3 20	3 60	4 00
3203	Unprepared, 50-yard roll	2 00	2 40	2 80

"NEPTUNE" MEDIUM.

	Widths in inches	30	36
3210	Prepared, 10-yard roll	$ 90	$1 05
3212	" 50 " "	3 90	4 70
3213	Unprepared, 50-yard roll	2 70	3 60

Special price per pound in original rolls, unprepared, of about 100 to 125 pounds.

BLUE PRINT PAPERS—Continued.

"NEPTUNE" HEAVY.

	Widths in inches	30	36
3220	Prepared 10-yard roll	$1 10	$1 25
3222	" 50 " "	5 00	5 80
3223	Unprepared, 50-yard roll	3 90	4 80

"CLIMAX" BLUE PRINT CLOTH.

	Widths in inches	36	42
3230	Prepared, 10-yard roll	$3 50	$5 00
3233	Unprepared, 10-yard roll	2 75	4 00

"UNIQUE" DIRECT BLACK-PRINT PAPER.

Black Lines on White Ground.

DIRECTIONS FOR USE:

This paper is to be treated as ordinary blue-print paper.
It should be exposed from 5 to 10 minutes, according to the strength of the sun.
Expose the paper until it becomes white under the tracing.
If the paper has not been exposed long enough, the ground will not be clear, and if exposed too long the fine lines will be faded.
It requires only a water bath, which must be kept clean, and the prints should be left in the bath about ten to fifteen minutes.
Keep the paper dry and in a dark place.

	Widths in inches	30	36	42
3240	Prepared, 10-yard roll	$2 00	$2 50	$3 00

PRINTS MADE OR TRACINGS COPIED.

By our new process, **"CYANOTYPE,"** or **Blue Lines on a White Ground;** also by the old process, **White Lines on a Blue Ground,** known as "Blue Prints."

Architects, Engineers and Draughtsmen using copies of their drawings may send their tracings to us for reproduction by the above processes and can rely on us for a speedy execution of their orders and return of their originals and copies.

	Per Sq. Ft.
Blue Lines on a White Ground or **"Cyanotype Prints"** on paper,	$ 08
White Lines on a Blue Ground or **"Blue Prints"** on paper,	04
" " " " " " " " linen,	08

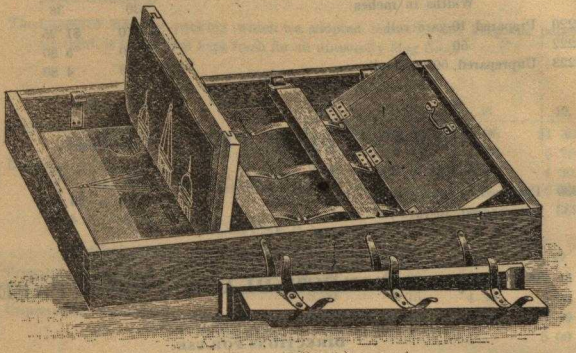
Small prints by either process, on paper, at 10 cents each.

Special Prices Made for Quantities.

Samples of Blue-Print Papers sent on application.

BLUE PRINT FRAMES.

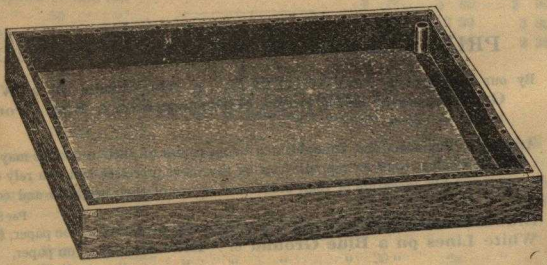
Made of hard wood, well finished with brass mountings.



		Frame Only Each.	With Double-Thick Glass and Felt Cushion.	With Polished Plate Glass and Felt Cushion.
3250	Size, 20 x 24 inches . .	$ 6 25	$ 7 50	$10 25
3251	" 24 x 30 " . .	8 00	9 50	12 50
3253	" 30 x 42 " . . .	12 50	——	22 75
3255	" 36 x 60 " . .	20 00	——	43 00

ZINC-LINED BATH TRAYS.

With drain pipe, stongly wired rim and hard-wood braces.



3260	Size, 20 x 24 inches	each, $3 75
3261	" 24 x 30 "	" 4 50
3263	" 30 x 42 "	" 6 00
3265	" 36 x 60 "	" 8 00

PROFILE PAPERS.

PRINTED IN RED OR GREEN.

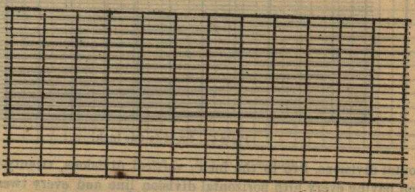


Plate A. 4 x 20 to one inch.

Horizontal divisions, four to the inch; vertical divisions, twenty to the inch, and having every tenth horizontal division line and every fiftieth vertical division line heavier than the others.

		Per Sheet.	Per Quire.
3280	Plate A.—In sheets, engraving 42 inches long by 15 inches wide,	$ 40	$8 50
3281	" A.—In continuous rolls, engraving 22 inches wide, in rolls of 50 yards . . . . . per yard,		30
3282	" A.—In continuous rolls, muslin backed, engraving 22 inches wide, in rolls of 20 yards . . . . . per yard,		75
3283	" A.—In continuous rolls, printed on Transparent Parchment Paper, 22 inches wide, in rolls of 50 yards, per yard,		30

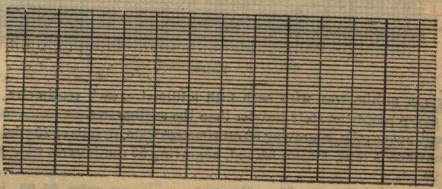


Plate B. 4 x 30 to one inch.

Horizontal divisions, four to the inch; vertical divisions, thirty to the inch, and having every fourth horizontal division line and every twenty-fifth vertical division line heavier than the others.

		Per Sheet.	Per Quire.
3285	Plate B.—In sheets, engraving 15 x 42 inches	$ 40	$8 50
3286	" B.—Continuous, engraving, 20 inches wide, in rolls of 50 yards . . . . . per yard,		30
3287	" B.—Muslin backed, engraving 20 inches wide, in rolls of 20 yards . . . . . per yard,		75
3288	" B.—Printed on Transparent Parchment Paper, 22 inches wide, in rolls of 50 yards . . . . . per yard,		30

PROFILE PAPERS—Continued.

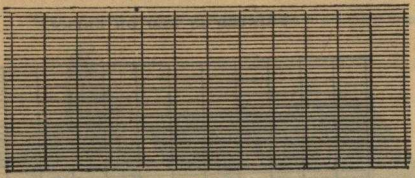


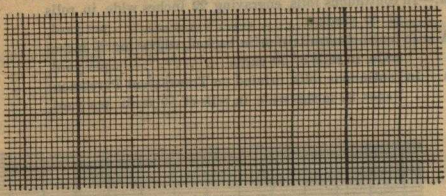
Plate C. 5 x 25 to one inch.

Horizontal divisions, five to the inch; vertical divisions, twenty-five to the inch, and having every fifth horizontal division line and every twenty-fifth vertical division line heavier than the others.

		Per Sheet.	Per Quire.
3290	In sheets, engraving 15 x 42 inches	$ 40	$8 50

CROSS SECTION PAPERS.

PRINTED IN RED OR GREEN.



Metric.

Metric in millimetres, with each fifth millimetre, each centimetre, and each decimetre proportionately heavier than the millimetres.

3295	In continuous rolls, engraving 50 centimetres wide, in rolls of 20 yds.,	per yd.,	$ 30
3296	In continuous rolls, Muslin backed, engraving 50 centimetres wide, in rolls of 20 yds.	per yd.,	75
3297	In sheets, engraving 40 x 50 centimetres	per quire, $5 00	per sheet, 25

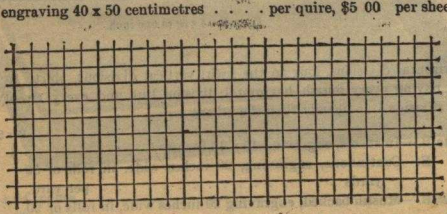


Plate D. 8 feet to the inch.

		Per Sheet.	Per Quire.
3300	In sheets, engraving 20 x 16 inches	$ 25	$5 00

CROSS SECTION PAPERS—Continued.

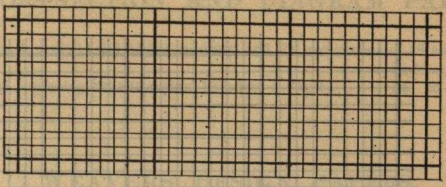


Plate F. 10 x 10 to the inch.

3302 In sheets, engraving 20 x 16 inches . . . . . per sheet, 25c., per quire, $5 00
3303 Continuous, 20 inches wide, in rolls of 50 yards . . . . . per yard, 30
3304 " 20 " " " 20 " mounted on cloth, " 75
3305 " 20 " " " 50 " on Tracing Paper,
Orange only . . . . . " 30

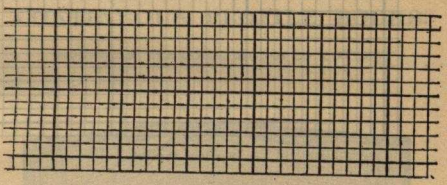


Plate G. 5 x 5 to ½ inch.

		Per Sheet.	Per Quire.
3308	In sheets, engraving 22 x 16 inches	$ 25	$5 00
3309	Printed on Parchment Tracing Paper, in sheets, 18 x 20 inches . .	25	5 00

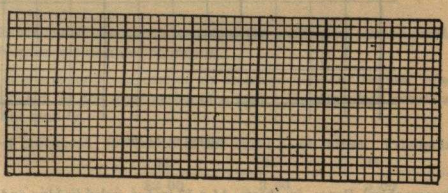
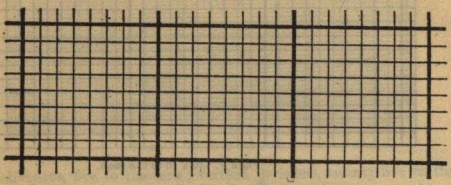


Plate H. 16 x 16 to the inch.

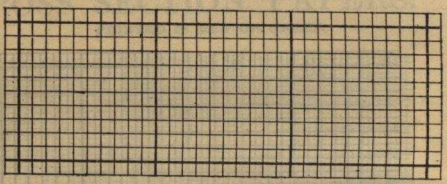
		Per Sheet.	Per Quire.
3310	In sheets, engraving 21 x 16 inches	$ 25	$5 00

CROSS-SECTION PAPERS—RULED.



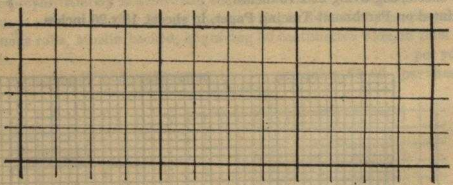
8 x 8 to the inch.

3315 In sheets, 16 x 21 inches, ruled in blue . . . . . per quire, $1 00



10 x 10 to the inch.

3317 In sheets, 16 x 21 inches, ruled in blue . . . . . per quire, $1 00



400 feet to the inch.

3319 Topographical Paper, in sheets, 14 x 17 inches, ruled in blue and red . . . . . per quire, $1 00

Samples of Cross-Section Papers sent on application.

TRAUTWINE'S CROSS-SECTION AND DIAGRAM PAPER.

For embankments 14 and 24 feet roadway, and for excavations of 18 and 28 feet.

		Per Sheet.	Per Quire.
3320	In sheets, engraving 19¾ x 12 inches, 10 feet to the inch	$ 25	$5 00

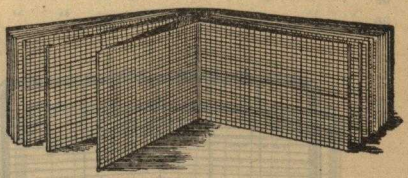
WEAVERS' DESIGN PAPERS.

		Per Sheet.	Per Quire.
3322	In sheets, 18 x 23 inches	$ 10	$2 00
3323	" 23 x 36 "	15	3 50

Sample Books furnished on application.

CONTINUOUS PROFILE BOOKS.

BOUND IN FLEXIBLE MOROCCO COVERS.



These books are folded like a map, to replace the continuous rolls of profile paper and the pages are mounted on muslin.

Each leaf, or two pages facing, contain six thousand feet— a "Section"—as generally laid out for the construction of a road. The paper lays smooth and is of extra fine quality.

3326 Plate A.—4 horizontal, 20 vertical to the inch; 5½ x 8 inches. Printed in green.

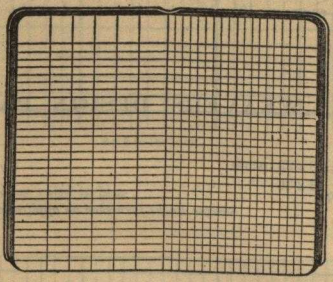
Miles	12	25	50	100
Each	$2 00	3 00	5 00	8 00

3327 Plate B.—4 horizontal, 30 vertical to the inch; 4¾ x 8 inches. Printed in green.

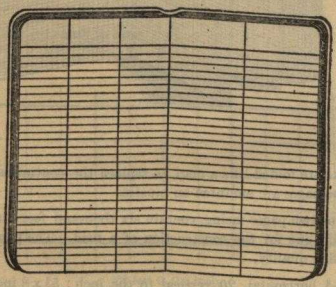
Miles	12	25	50	100
Each	$2 00	3 00	5 00	8 00

ENGINEERS' FIELD BOOKS.

BOUND IN LEATHER.

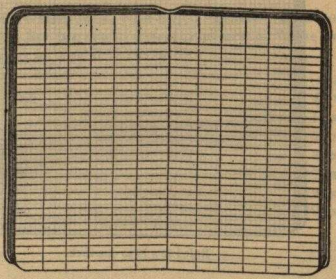


		Each.	Per Doz.
3330	Field Book, 4½ x 7½ inches, 80 leaves smooth paper	$ 55	$6 00
3331	" " " " 60 " " "	45	5 00
3332	" " " " 60 " drawing "	55	6 00

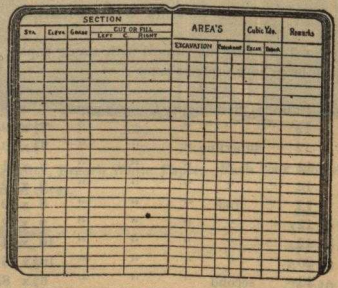


		Each.	Per Doz.
3335	Level Book, 4 x 6½ inches, 80 leaves smooth paper	$ 50	$5 50
3336	" " " " 60 " " "	40	4 50
3337	" " " " 60 " drawing "	50	5 50

ENGINEERS' FIELD BOOKS—Continued.

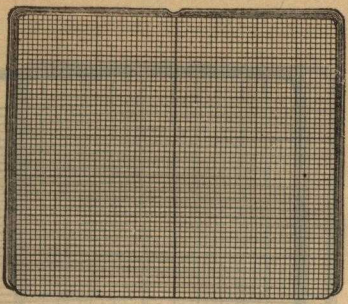


		Each.	Per Doz.
3340	Transit Book, 4½ x 7½ inches, 80 leaves smooth paper	$ 55	$6 00
3341	" " " " 60 " " "	45	5 00
3342	" " " " 60 " drawing "	55	6 00



		Each.	Per Doz.
3344	Field Book, 5 x 7¾ inches, 80 leaves with printed heading and smooth paper	$ 80	$9 00

ENGINEERS' FIELD BOOKS—Continued.



Ruled 10 x 10 to one inch.

		Each.	Per Doz.
3345	Cross-Section Book, 4½ x 7½ inches, 80 leaves	$ 55	$6 00
3346	" " " 7 x 8¼ " 80 "	85	9 50

We make to order any other style of Field and Cross Section Books in lots of six dozen of one kind only.

3360

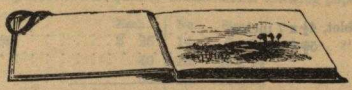
BLANK DRAWING BOOKS.

TINTED COVERS, WITH DESIGNS.

All books from No. 1 to 15 are interleaved with tissue paper. Books of equal size and higher in price have superior paper.

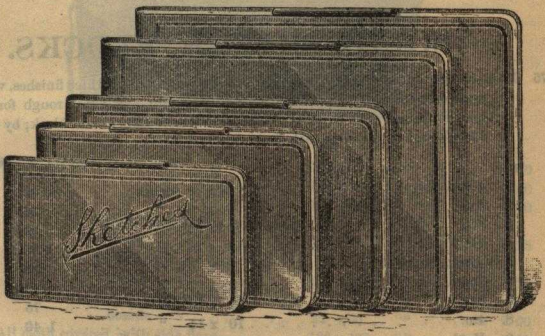
No.								Size.	Each.	Per Doz.
1.	Paper cover,	12	leaves,	first	quality	German	paper,	7 x 8½ in.,	$ 12	$1 20
2.	" "	12	"	"	"	"	"	7½ x 9½ "	15	1 50
4.	Stiff "	12	"	superfine	"	"	"	7½ x 10 "	25	2 50
5.	" "	12	"	"	"	"	"	8 x 11 "	30	3 25
6.	" "	12	"	"	"	"	"	9 x 12 "	40	4 00
7.	" "	12	"	first	"	"	"	8 x 10 "	25	2 50
8.	" "	12	"	"	"	"	"	9 x 12 "	30	3 00
9.	" "	12	"	"	"	"	"	10 x 14 "	45	4 50
12.	" "	20	"	"	"	"	"	10½ x 15 "	85	8 50
13.	" "	12	"	second	"	"	"	6⅜ x 8½ "	09	90
14.	" "	12	"	"	"	"	"	7⅞ x 9⅝ "	12	1 20
15.	" "	12	"	"	"	"	"	8¾ x 10⅝ "	15	1 50
16.	"Unicorn."	Stiff cover,	30	leaves,	American	paper,		8 x 9½ "	15	1 50
17.	"	"	24	"	"	"	"	8½ x 11 "	15	1 50
18.	"	"	20	"	"	"	"	9 x 12 "	15	1 50

BLANK DRAWING BOOKS—Continued.



3362 Bound in cloth, leather back, with loop for pencil. Each book contains 32 leaves of best quality **WHITE** or **TINTED** papers, or White and Tinted assorted, for Water color or Pencil Drawing.

No.		Size.	Each.
1.	Sketch Book	4 x 5½ inches,	$ 35
2.	" "	4½ x 6½ "	45
3.	" "	5½ x 7½ "	60
4.	" "	6½ x 9½ "	75
5.	" "	7½ x 10½ "	1 00
6.	" "	9 x 12 "	1 25
7.	" "	10½ x 15 "	1 50



3364 Ordinary Quality, French White Paper. Each book contains 24 leaves. Bound in gray linen cover.

No.		Size.	Each.
9.	Sketch Book	4 x 7 inches	$ 25
10.	" "	5½ x 8 "	30
11.	" "	6 x 9 "	35
12.	" "	7½ x 10 "	50
13.	" "	9 x 11 "	60
13½.	" "	10 x 14 "	75
14.	Ordinary Sketch Book, for Pencil Sketching, white paper, bound in stiff paper cover, size 5 x 7½, 50 leaves		20

3366 **PORTFOLIO SKETCHING TABLETS.**

SEAL OR RUSSIA LEATHER BINDING.

	Size.	Each.
Size of Tablet,	4½ x 7 inches	$1 00
" "	5½ x 9 "	1 35

3368 **SKETCHING PADS.**

FOR PENCIL DRAWING.

	Size	Each.
Buff Paper, 50 leaves	6 x 9 inches	$ 05
" " 50 "	8½ x 11 "	10

3370 **ACADEMY DRAWING TABLETS.**

FOR PENCIL DRAWING.

	Size.	Each.
White or Buff, 35 leaves	4½ x 7 inches	$ 06
" " 35 "	5¾ x 9 "	10

SOLID SKETCH BLOCKS.

3375 Made of best quality **WHATMAN'S** Drawing Papers, in three finishes, viz: hot-pressed or smooth, cold-pressed with slight grain, and extra rough for Water-color Painting. The paper is so compressed as to form a solid block; by running a knife around the edge each sheet can be easily separated.

No.		Size.	Unbound.	*Bound in Portfolio.
1.	16mo. Royal	4½ x 6 inches	$ 30	$ 75
2.	8vo. "	6 x 9 "	55	1 20
3.	4to. "	9 x 12 "	90	1 75
4.	Half "	12 x 18 "	1 75	3 00
5.	32mo. Imperial	3½ x 5½ "	30	65
6.	16mo. "	5½ x 7 "	40	90
7.	8vo. "	7 x 10 "	75	1 50
8.	4to. "	10 x 14 "	1 40	2 25
9.	Half "	14 x 20 "	2 50	3 75

*The binding has cloth sides and leather back, with a pocket and loop for pencil inside. The portfolio will last a number of blocks.

3377 Made of **WHATMAN'S** best Imperial Drawing Papers, extra heavy (140 pounds). Hot-pressed, cold-pressed and rough.

No.		Size.	Each.
20.	Solid Sketch Block, 16mo. Imperial	5 x 7 inches	$ 70
21.	" " " 8vo. "	7 x 10 "	1 25
22.	" " " 4to. "	10 x 14 "	2 50
23.	" " " Half "	14 x 20 "	4 50

SOLID SKETCH BLOCKS—Continued.

3379 Solid Sketch Blocks, made of first quality **GERMAN** drawing paper. Unbound.

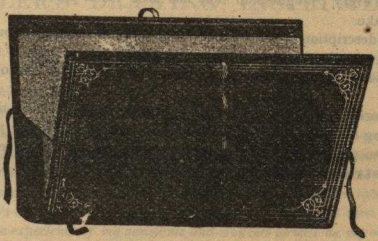
No.	Size.	Each.	No.	Size.	Each.
10.	4½ x 6 inches	$ 25	14.	7 x 10 inches	$ 50
11.	6 x 9 "	40	15.	10 x 14 "	80
12.	9 x 12 "	60	16.	12 x 18 "	1 00
13.	5½ x 7 "	30	17.	14 x 20 "	1 50

3380 **SECOND QUALITY.**

Sizes, inches	5 x 7	6 x 9	7 x 10	9 x 12	10 x 14	14 x 20
Each	$ 20	25	30	45	60	1 00

PORTFOLIOS.

THESE PORTFOLIOS ARE MADE OF THE VERY BEST MATERIALS.



No.		Size.	Each.
3385	1. Paper covered, cloth back,	12¾ x 17½ inches	$ 70
"	2. " " " "	14½ x 18 "	80
"	3. " " " "	17 x 22 "	1 00
3386	3½. " " leather back and corners, heavy boards,	19 x 25 "	1 25
"	4. " " leather back and corners, heavy boards	20 x 27 "	1 75
"	5. " " leather back and corners, heavy boards	22 x 31 "	2 00
3387	1. All cloth covered, with side flaps,	12¾ x 17½ "	1 10
"	2. " " " " "	14½ x 18 "	1 25
"	3. " " " " "	17 x 22 "	1 65
"	4. " " " " "	19½ x 25 "	2 10
"	6. " " " " "	22 x 28 "	2 60
"	8. " " " " "	24 x 31½ "	3 25
"	10. " " " " "	27 x 31½ "	4 00
"	12. " " " " "	29 x 34 "	5 00
3388	2. All leather covered, with side flaps,	14½ x 18 "	4 00
"	3. " " " " "	17 x 21 "	5 00
"	4. " " " " "	19½ x 25 "	6 00
"	6. " " " " "	22½ x 27 "	7 00

RIEFLER'S PATENT

GERMAN-SILVER DRAWING INSTRUMENTS.

SUPERIOR QUALITY.

F. WEBER & CO., SOLE AGENTS.

To our Patrons:—

It is not quite eight years since we introduced **Riefler's Patent Round-System Drawing Instruments** in this country, and it is very gratifying now for us to state that, during this short period they have not only fought every prejudice brought into the field against them by jealous manufacturers of the old systems, but have made such great progress through their most practical and novel form of construction and through their excellence of quality, that every Professor of the many Colleges where they have been adopted, as also every Draughtsman that has used them, pronounce them to be superior to any other make.

A detailed description of the System would seem almost superfluous, and we therefore confine ourselves in the description that follows herewith, to some of the most important points, which show their superiority of construction towards the old triangular-shape system.

The superiority of this Round System is further manifested by the many imitations that have sprung up lately, but which cannot be compared in quality to the **Riefler's,** and in order to protect our patrons against such, we have stamped every **genuine Riefler's Instrument** with our initials, "F. W. & Co."

F. WEBER & Co.

Description.

1. The heads of all Dividers are clamped by the Pivot joint and extend partly over their circle along the shanks. This gives the legs greater firmness and enables the draughtsman to draw with greater accuracy the smallest circles with the largest Dividers.

2. The legs of the Dividers are cylindrical, giving thereby greatest strength and affording a more pleasant and convenient way of handling the Instruments than by the old style, with sharp edges.

3. The steel Points of the Dividers are cone-shaped and are screwed in in a slanting direction, converging towards the axis of the Dividers when the latter are closed. These joints can be replaced by new ones at a trifling expense when worn out or broken.

4. The Pinions of the Pen, Pencil and Needlepoint parts, also of the Lengthening Bar are cylindrical and are split to give them elasticity. They fit with a slight taper into corresponding sockets. A slot is cut longitudinally on one side of each socket, which insures a close fit and a a certain flexibility. A wedge attached to each pinion fits into the above slot to hold the respective part in its position. The screws to hold the different parts like on the old system, are hereby made superfluous. Another great advantage, the construction of these Instruments has, is that any part of them, having been lost or damaged, can be replaced by a new one, which will fit the remaining part, as if it had been made for it.

RIEFLER'S INSTRUMENTS—Continued.

The best steel (Huntsman's) is used for all steel parts and the personal attention of Mr. Riefler given to every Ruling Pen is a sufficient guarantee of their excellent quality.

We beg to draw attention to Instruments Nos. 3490 and 3491 Spring Bowpens, No. 3428 Pocket Divider, Nos. 3570 and 3575 Dotting Pen, Nos. 3500, 3502 and 3504 Beam Compasses, and his lately invented Section Liner, which are novel in their construction and unsurpassed by any other make as to their usefulness and practicability.

To add weight to our claims for these Instruments, we append herewith some of the many Testimonials, which speak for themselves.

TESTIMONIALS

OF

RIEFLER'S DRAWING INSTRUMENTS.

Engineering Department, Harvard University,
Lawrence Scientific School, Cambridge, Mass.

F. Weber & Co., Philadelphia,

Gentlemen:—The Riefler Instruments have been in use in this department since 1889, and each year more of them have been purchased by students than during any preceding year. They have replaced the Alteneder Instruments almost entirely, not from the recommendations of the instructors, but by the reputation they have gained by the students who have used them. They are every way first class and have given universal satisfaction. I consider them a very superior grade of instruments and equal to any sold in the market. Have used them myself, and base my opinion upon the experience of my assistants and students as well as my own. There is an imitation of the Riefler Instruments that you will do well to warn your customers about. They are an inferior and cheaper class of instruments. Yours truly,

JOHN C. WAIT,
Professor of Engineering.

Commissioners for the Erection of Public Buildings City Hall,
Architect's Office, Philadelphia, Pa.

Messrs. F. Weber & Co.

Gentlemen:—I take pleasure in testifying to the excellence of the Riefler Drawing Instruments. I believe I was the first in this city to use them and have been so well pleased that I shall continue to do so and to recommend them to others desiring a first-class make of instruments.

Yours very truly, W. BLEDDYN POWELL,
Architect, City Hall.

5440 Claiburn St., Shadyside, Pittsburg, Pa.

Messrs. F. Weber & Co.

Gentlemen:—Riefler's Instruments for draughting purposes have met my entire satisfaction for many years, and I consider them unequaled by any other make now on the market, having an experience of about ten years in the use of different kinds of instruments.

Yours truly, ALFRED FESSLER,
Mechanical Engineer.

RIEFLER'S INSTRUMENTS—Continued.

United States Engineer Office, Wilmington, Del.

Messrs. F. Weber & Co., Philadelphia, Pa.

Gentlemen:—About twenty years ago I had the pleasure to meet a young landscape engineer at Philadelphia, who had just arrived from the old country. He showed me the first set of Riefler's Drawing Instruments which I had not seen before. I was at once struck by their simple beauty and the advantages they seemed to possess when compared with the old-fashioned instruments. Not long after this meeting I began to use Riefler's Instruments and have done so ever since, and do not hesitate to say that I believe them to be ahead of any other in workmanship, in ease of adjusting or replacing broken or missing parts, and particularly in the agreeable touch to the hand when being used.

Respectfully yours,

A. STIERLE,
Assistant Engineer U. S. Engineer Department.

Richard C. Borchers, Keystone Clutch and Machine Works, Philadelphia, Pa.

Messrs. F. Weber & Co.

Gentlemen:—I have had the Riefler Instruments in use since 1875, and can say that they are in every respect, with the exception of the wear at the points of the pens, to-day as good as new. I bought these instruments from Riefler direct, while in Germany, because I saw at once that the way the different pieces were fitted into the dividers was superior to the way this is done by other makers. There are no screws to slip the thread and no small ends with sharp corners to wear off and get loose. I therefore take pleasure in testifying to the superior workmanship and construction of the Riefler Instruments, and recommend them to anyone who wants to possess a lasting, good set of instruments

Yours truly,

RICHARD C. BORCHERS.

Alfred V. E. Poulsen, Mechanical Engineer, Buffalo, N. Y.

F. Weber & Co., Philadelphia.

Gentlemen:—It gives me pleasure to testify to the satisfaction which Riefler's Drawing Instruments have given me. I have used same for the last six years, and found them to be of first-class workmanship, besides the round system is to be preferred to the old system with the sharp edges.

Yours truly,

ALFRED V. E. POULSEN.

L. S. Jacoby, Architect and Civil Engineer, Allentown, Pa.

Messrs. F. Weber & Co.

Gentlemen:—Among the points of superiority of the Riefler Instruments which led me to adopt them was the absence of sharp edges which made the larger instruments pleasant to the touch; the joint which requires no clumsy projecting screws to work loose unexpectedly, and the minimum of metal with the maximum of strength. I have used them for years and expect to use them in the future.

Yours very truly,

S. A. WEISHAMPEL,
Chief Draughtsman.

Purdue University, Lafayette, Ind.

F. Weber & Co., Philadelphia, Pa.

Dear Sirs:—Your instruments have been in use here for several years and have given perfect satisfaction. I have personally used your Riefler Instruments during the last five years and find them well made, light, stiff and durable.

Yours truly,

JOHN J. FLATHER,
Professor of Mechanical Engineering.

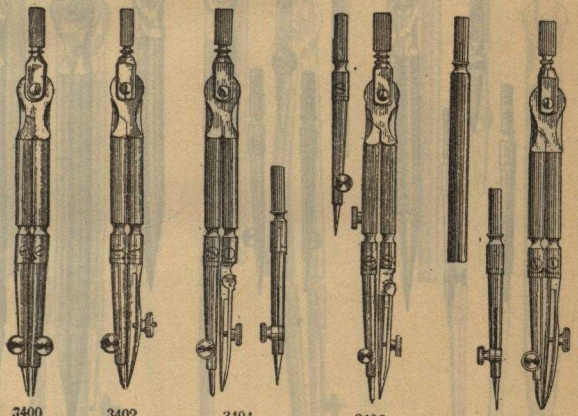
RIEFLER'S

GERMAN-SILVER INSTRUMENTS.

SUPERFINE QUALITY, BEST GERMAN SILVER AND ENGLISH STEEL.

All Genuine Riefler's Instruments are Stamped "F. W. & Co."

Illustrations ⅔ size.



3400 3402 3404 3406 3408

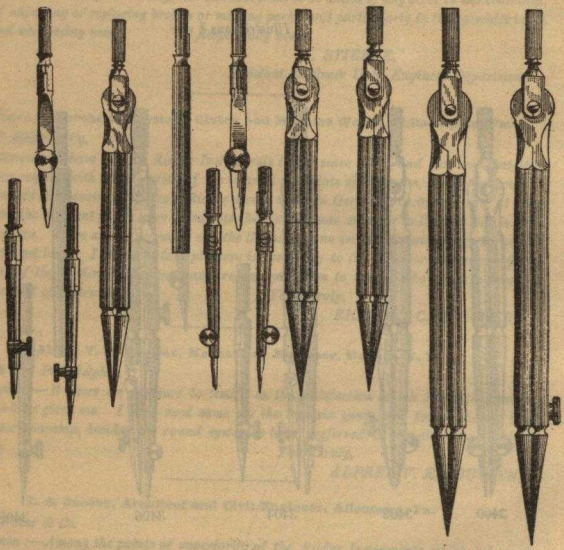
Old No.					
3400—6A	Compass, 3½ inches, with fixed Pencil and Needle Point . . .				each, $4 00
3402—6B	" 3½ "	" " "	Pen " " "		" 4 00
3404—6	" 3½ "	" " "	Needle Point, Pen and Pencil parts,		" 4 80
3406—6½	" 3½ "	like No. 3404, with hair spring on fixed Needle Point			" 6 25
3408—4½	" 3½ "	with fixed Needle Point, Pen and Pencil parts and Lengthening Bar			" 5 40

For Single Parts of Instruments see page 92.

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler's Instruments are Stamped "F. W. & Co."

Illustrations ⅔ size.



3412 3413 3416 3418 3420

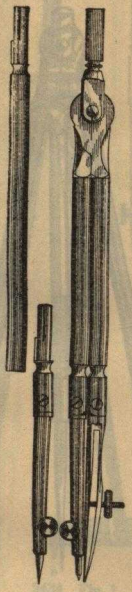
Old No.		
3412—5	Compass, 3½ inches, with Pen, Pencil and Needle-Point parts . . .	each, $5 40
3413—4	" 3½ " same as No. 3412, with Lengthening Bar . . .	" 6 00
3116—7	Plain Divider, 3½ inches, Round Steel Points	" 1 80
3417—	Hairspring Divider, 3½ inches, Round Steel Points	" 2 70
3418—8	Plain " 5 " " " " "	" 2 10
3419—9	" " 5½ " " " " "	" 2 40
3420—10	Hairspring " 5 " " " "	" 3 00

For Single Parts of Instruments see page 92.

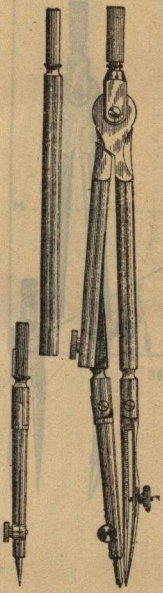
RIEFLER'S INSTRUMENTS – Continued.

All Genuine Riefler's Instruments are Stamped "F. W. & Co."

Illustrations ⅔ size.



3422



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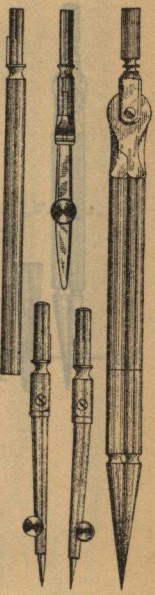


3424

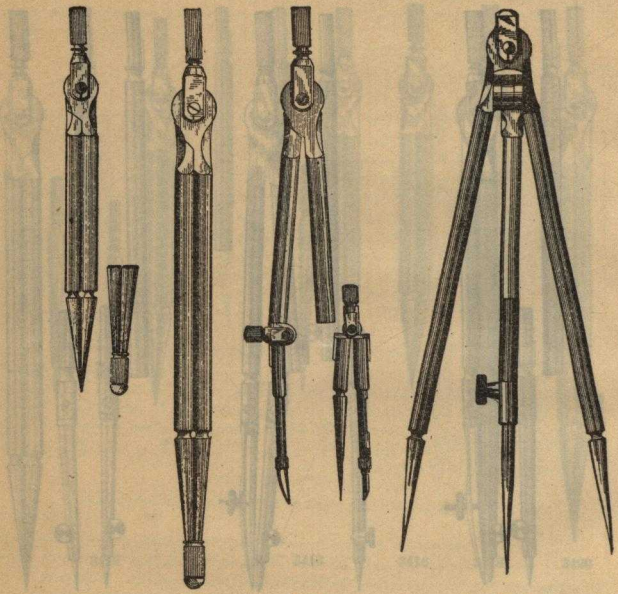
Old No.		
3422—3	Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar . . . . . each,	$6 30
3423—3½	Compass, 5½ inches, like No. 3422, with Hairspring on fixed Needle Point . . . . . "	7 50
3424—2	Compass, 5½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar . . . . . "	7 20

For Single Parts of Instruments see page 92.

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."

Illustrations ⅔ size.



3426 3427 3428 3432

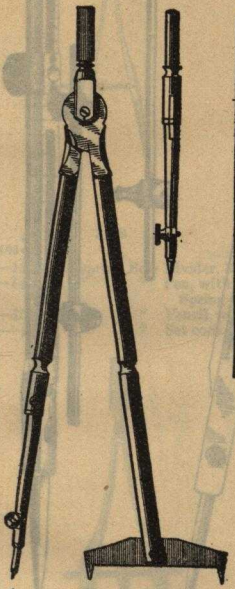
Old No.		
3426—11A	Pocket Divider with Sheath, 3½ inches . . . . . each,	$2 40
3427—11	" " " " 5 " . . . . . "	2 75
3428—12	" Compass, 4¾ inches, with Pen and Pencil parts, which can be withdrawn, each part forming a separate minute Bow Pen and Pencil, in Leather Case . . . . . "	9 00
3430—Pocket	Compass, in Octagonal, 7½ inches, like No. 3428, with 2 Lengthening Bars, in Leather Case . . . . . "	11 50
3432—12½	Three-Legged Divider, 6 inches, for taking off 3 Points, 1 leg adjustable . . . . . "	5 75

RIEFLER'S INSTRUMENTS—Continued.

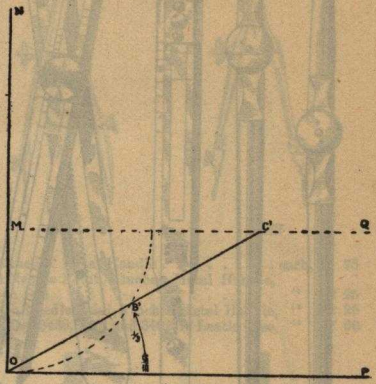
All Genuine Riefler Instruments are Stamped "F. W. & Co."

Illustrations ⅜ size.

Angle Trisector.



3434 Fig. 1.



3434 Fig. 2.

A very simple device for trisecting an angle less than 120 degrees.

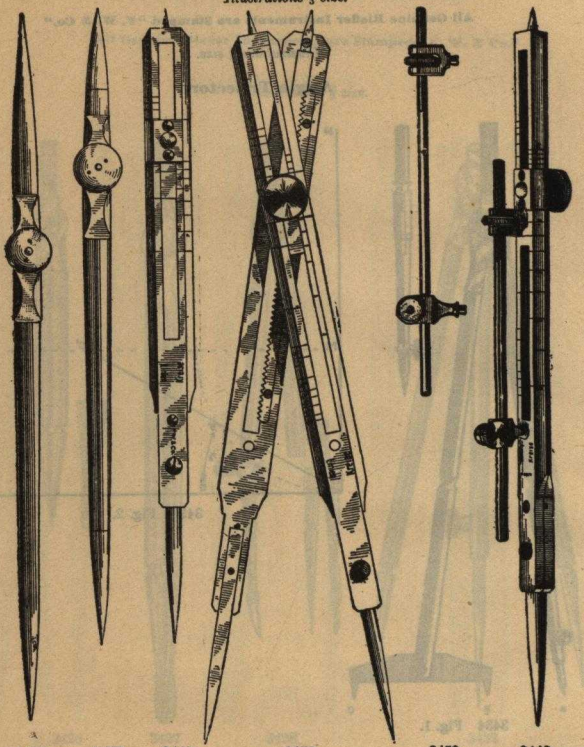
Description.—Let N O P of Fig. 2 form the given angle, whose third part it is desired to find by the following method: To accomplish this, lay off the distance B C of Trisector (Fig. 1) on **Perpendicular** O N, which forms O M. With O M as radius describe a semi-circle, having its centre at M, then draw the line M Q indefinitely, parallel with O P, place point A of Trisector firmly on O, move with point C along the line M Q in such a manner until point B meets the circle at B^1, then draw the line O B^1. Now by construction, O B^1 P forms the third part of the given angle.

3434 Angle Trisector, 5½ inches, with Pencil Point . . . . . each, $6 50

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."

Illustrations ⅔ size.



3436 3437 3442 3450 3452 3448

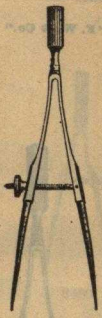
Old No.		
3436—23	Whole and Half Divider, 7½ inches	each, $4 00
3438—	" " Third Divider, 6¼ inches	" 4 00
3442—19	Proportional Divider, 7 inches, for lines and circles, with Steel Points screwed in, for lines 2 to 10, and circles 7 to 20	" 9 00
3444—20	Proportional Divider, 8 inches long, for lines and circles, for lines ⅓ to 10, and for circles 3 to 20	" 11 40
3446—21	Proportional Divider No. 3442, with Micrometer Attachment	" 10 80
3448—22	" " No. 3444, " " "	" 13 20
3450—	" " 8 inches, with Rack Movement	" 13 50
3452—	Micrometer Attachment separate	" 1 80

Morocco Cases for Nos	3436	3438	3442	3444	3346	3448	3450
Each	$ 75	$ 75	$ 60	$ 60	$1 00	$1 00	$1 00

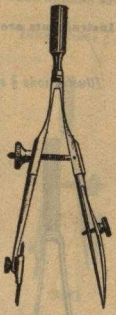
RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."

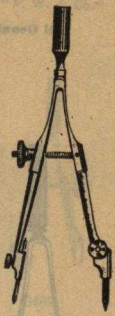
Illustrations ⅔ size.



3460

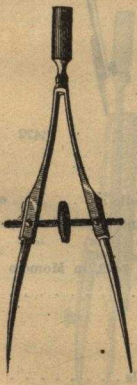


3461

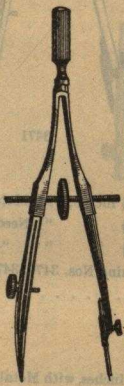


3462

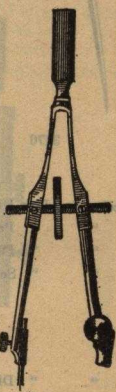
Old No.			
3460—13	Steel-spring Bow Divider, 3 inches, Metal Handle	each,	$1 75
3461—14	" " Pen, with Needle Point, 3 inches, Metal Handle, Spring on Pen	"	2 25
3462—15	" " Pencil, with Needle Point, 3 inches, Metal Handle,	"	2 25
3463——	" " Set cont. Nos. 3460, 3461 and 3462, in Leath. Case,	"	7 00



3465



3466



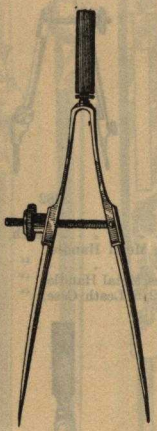
3467

Old No.			
3465—13½	Steel-spring Bow Divider, 3½ inches, with Nut between Shanks . .	each,	$2 50
3466—14½	" " Pen, 3½ inches, Needle Point " "	"	3 00
3467—15½	" " Pencil, 3½ inches, " " " "	"	3 00
3468——	" " Set cont. Nos. 3465, 3466 and 3467, in Leath. Case,	"	9 50

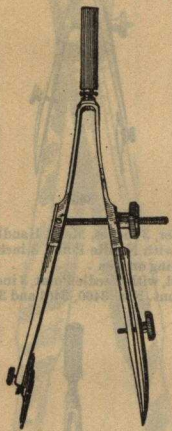
RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."

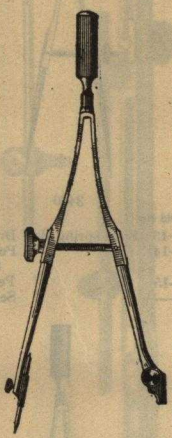
Illustrations ⅔ size.



3470



3471



3472

3470	Steel-spring Bow Divider, 4½ inches, with Metal Handle	each,	$2	75
3471	" " Pen, 4½ " " Needle Point, Metal Handle,	"	3	25
3472	" " Pencil, 4½ " " " " " " "	"	3	25
3473	" " Set containing Nos. 3470, 3471 and 3472, in Morocco Case	"	10	50
3475	" " Divider, 6 inches, with Metal Handle	"	3	00
3476	" " Pen, 6 " " Needle Point, Metal Handle,	"	3	50
3477	" " Pencil, 6 " " " " " " "	"	3	50
3478	" " Set containing Nos. 3475, 3476 and 3477, in Morocco Case	"	11	50

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."

Illustrations ⅔ size.

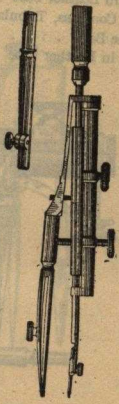
3480

3481

3482

3480 Minute Steel-spring Bow Divider, 2¼ inches, with Metal Handle . . . each, $1 75
3481 " " " Pen 2¼ " " " " . . . " 2 00
3482 " " " Pencil, 2¼ " " " " . . . " 2 00
3483 " " " Set containing Nos. 3480, 3482 and 3483, in Leather Case . . . . . " 6 50

3490



3491

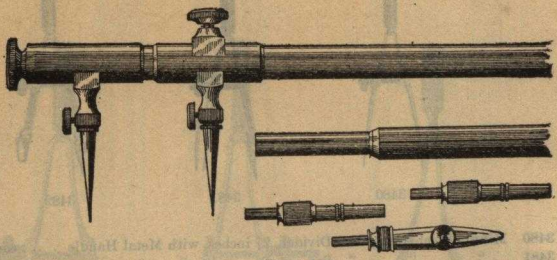
Old No.

3490—16 Steel-spring Bow Pen, 3½ inches, with Pen part sliding and self-adjusting, for very small circles . . . . . each, $2 75
3491—17 Steel-spring Bow Pen, same as No. 16, with Pencil part . . . . . " 4 20

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."

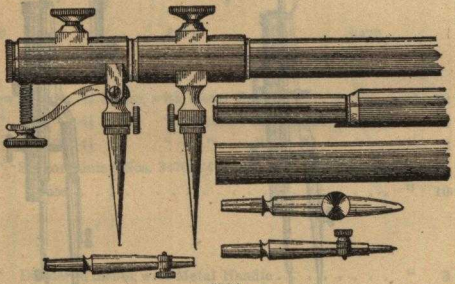
Illustrqtions ⅜ size.



3500

Old No.

3500—24 Beam Compass, Tubular, 18 inches, with Bars, $\frac{5}{16}$ inch diameter, Micrometer Attachment, Pen, Pencil and Needle Point parts . . each, $ 9 60
3501—24*a* Same, in Leather Case . . . . . " 11 40
3502—25 Beam Compass, Tubular, same as No. 3500, 25 inches long, with three Bars . . . . . " 11 40
3503—25*a* Same, in Leather Case . . . . . " 13 50



3504

Old No.

3504—26 Beam Compass, Tubular, 39 inches, three Bars, ⅜ inch diameter, Improved Micrometer Attachment, Pen, Pencil and Needle Point parts . . . . . each, $18 00
3505—26*a* Same, in Leather Case . . . . . " 20 50

RIEFLER'S INSTRUMENTS—Continued.

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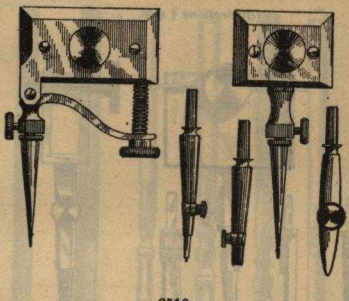
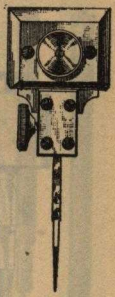
Illustrations ⅔ size.



3510



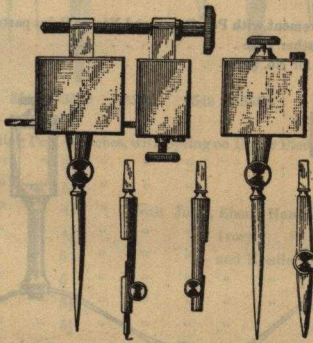
3512

Old No.

3510—27 Beam Compass, with Improved Micrometer Attachment, Pen, Pencil and Needle Point parts . . . . . each, $8 40

3511—27a Same as No. 3510, in Leather Case . . . . . " 9 60

3512—— Knife Attachment for No. 3510 . . . . . " 3 00



3516

3518

3516 Beam Compass, Micrometer Adjustment, with Pen, Pencil and Needle Point parts . . . . . each, $10 50

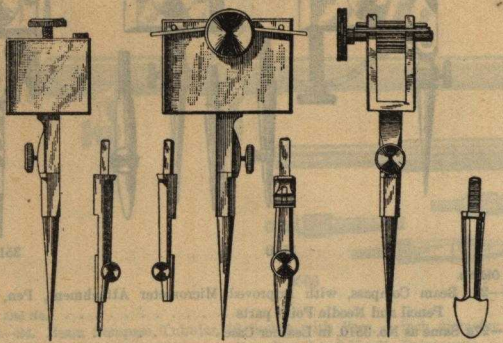
3517 Same as No. 3516, in Leather Case . . . . . " 12 00

3518 Knife Point Attachment for No. 3516 . . . . . " 1 00

RIEFLER'S INSTRUMENTS—Continued.

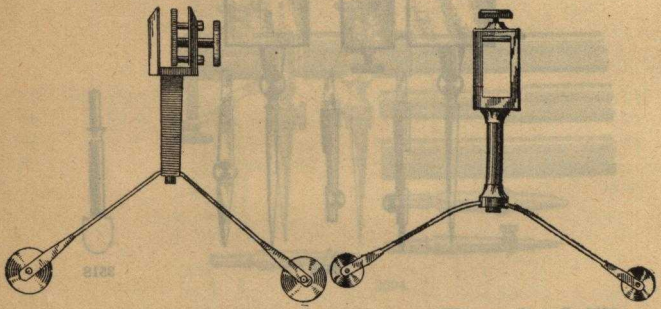
All Genuine Riefler Instruments are Stamped "F. W. & Co."

Illustrations ⅔ size.



3521 Section of Rack Movement. 3523

3521 Beam Compass, Rack Movement, with Pen, Pencil and Needle Point parts, each, $10 25
3522 Same as No. 3521, in Leather Case 11 50
3523 Knife Point Attachment for No. 3521 . . . . . 1 00



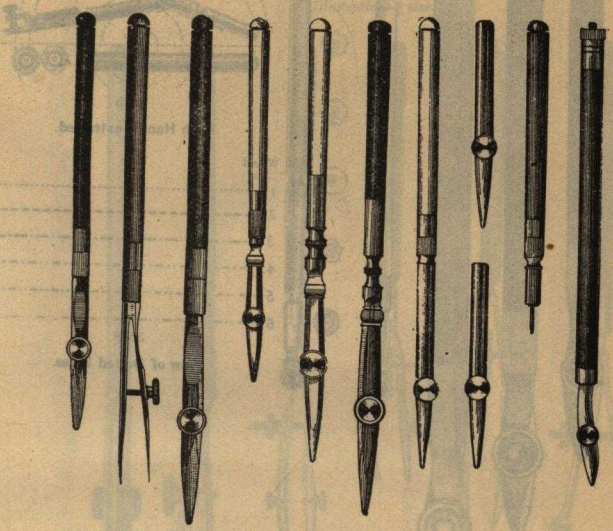
3525 3526

3525 Wheel Attachment for No. 3510 . . . . . each, $ 2 75
3526 " " " Nos. 3516 and 3521 . . . . . " 2 50

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co.'

Illustrations ⅔ size.



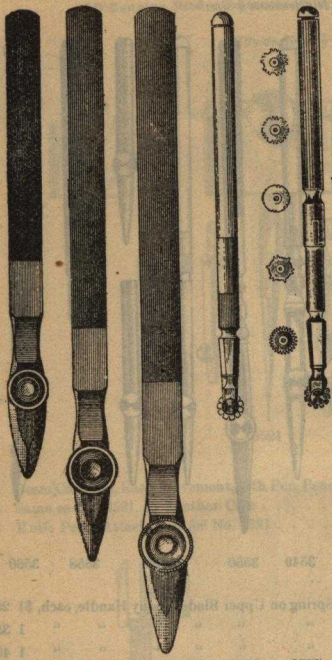
3540 3541 3542 3547 3549 3550 3556 3558 3560

Old No.		
3540—28½c	Ruling Pen, 4½ inches, with Spring on Upper Blade, Ebony Handle, each,	$1 25
3541—28½b	" " 5 " " " " " " " "	1 35
3542—28½a	" " 5½ " " " " " " " "	1 45
3546—34	" " 4½ " with Joint, Ebony Handle . . . . . "	1 20
3547—35	" " 4½ " " " Ivory " . . . . . "	1 20
3548—32	" " 5 " " " and Needle, Ebony Handle . . "	1 40
3549—33	" " 5 " " " " " Ivory " . . "	1 40
3550—30	" " 5½ " " " " " Ebony " . . "	1 50
3551—31	" " 5½ " " " " " Ivory " . . "	1 50
3555—36	Hatching Pen, with Needle Point, Ivory Handle . . . . . "	1 25
3556—36a	" " " " " " " two extra Pens, in Leather Case . . . . . "	3 00
3557—36½	" " without Handle . . . . . "	75
3558—37	Ivory or Ebony Handle, with Needle Point or Pricker to fit No. 36½, "	50
3560—54	Curve Pen, adjustable . . . . . "	1 80

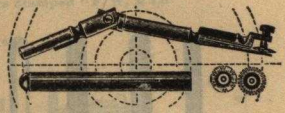
RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."

Illustrations ⅔ size.



3565 3566 3567 3570 3577



3575

With Handle extracted.

3578

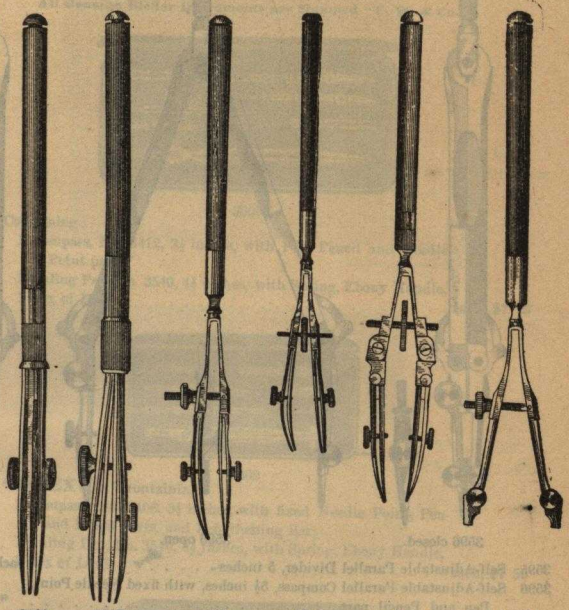
View of Dotted Lines.

Old No.			
3565—50	Swedish Detail Ruling Pen, 5 inches, Ebony Handle, with Spring on Upper Blade	each,	$1 80
3566—51	Swedish Detail Ruling Pen, 6 inches, Ebony Handle, with Spring on Upper Blade	"	1 90
3567—52	Swedish Detail Ruling Pen, 7 inches, Ebony Handle, with Spring on Upper Blade	"	2 00
3570—39	Dotting Pen, with Three Wheels, Ivory Handle	"	2 40
3571—39*a*	Same, in Leather Case	"	2 75
3572—39½*a*	Dotting Pen, same as No. 3570, with Six Wheels, in Leather Case,	"	4 00
3575—40	Dotting Pen, with Three Wheels, Milled Metal Handle, Pen part removable, and with Joint to fit in Dividers Nos. 3424 and 3422, for drawing circles or straight lines, see illustration No. 3575,	"	3 25
3576—40*a*	Same, in Leather Case	"	3 60
3577—40½*a*	Dotting Pen, like No. 3575, with Six Wheels, in Leather Case	"	4 50
3578 ——	Dotting Wheels separate	"	40

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."

Illustrations ¾ size.



3580 3582 3585 3586 3587 3588

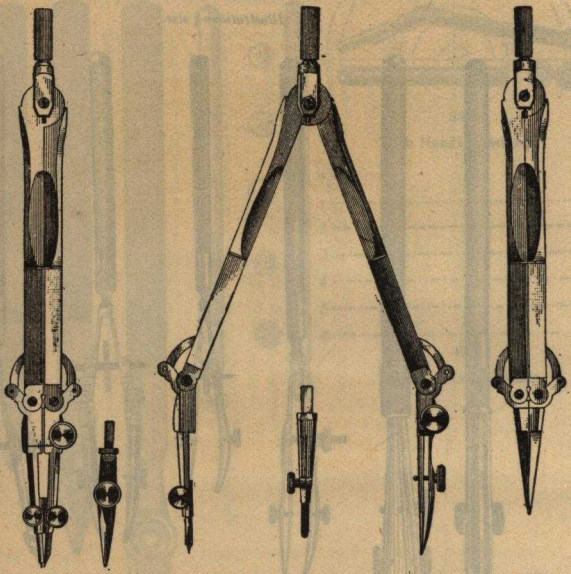
Old No.		
3580——	Border Pen, Three Blades, Ebony Handle, 6¼ inches . . . . . each,	$2 75
3582——	Double Border Pen, Four Blades, Ebony Handle, 6¼ inches . . . "	3 25
3585—38	Railroad Pen, Ebony Handle, 5¾ inches, with Pens bent in same direction . . . . . "	2 75
3586—38½	Railroad Pen, Ebony Handle, 5¾ inches, bent in same direction and with Set Screw between Shanks . . . . . "	3 25
3587—38¾	Railroad Pen, with Joints, Ebony Handle, 5¾ inches, Set Screw between Shanks . . . . . "	3 75
3588——	Railroad Pencils, Ebony Handle, 5¾ inches . . . . . "	2 75

For Single Parts of Instruments see page 92.

RIEFLER'S PARALLEL COMPASS.

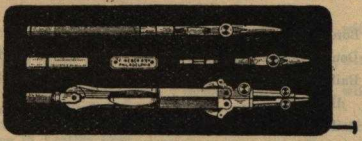
SELF ADJUSTABLE.

Illustrations ⅔ size.



3596 closed. 3596 open. 3595

3595 Self-Adjustable Parallel Divider, 5 inches . . . . . each, $ 5 00
3596 Self-Adjustable Parallel Compass, 5½ inches, with fixed Needle Point, Pen and Pencil part . . . . . " 7 50



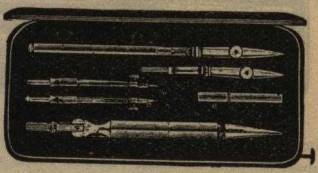
3597

3597 Leather Case, containing:
1 Riefler Self-Adjustable Parallel Compass, with fixed Needle Point, Pen and Pencil parts, No. 3596,
1 Riefler's Ruling Pen, 5 inches, No. 3541,
1 Box with Leads . . . . . each, $10 25

RIEFLER'S INSTRUMENTS.

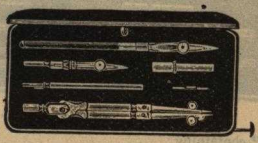
IN MOROCCO LEATHER CASES, LINED WITH SILK VELVET.

All Genuine Riefler Instruments are Stamped "F. W. & Co."



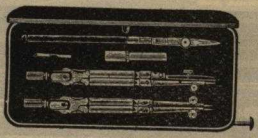
3600

Old No.
3600—150 Containing:
1 Compass, No. 3412, 3½ inches, with Pen, Pencil and Needle Point parts,
1 Ruling Pen, No. 3540, 4½ inches, with Spring, Ebony Handle,
1 Box of Leads . . . . . each, $7 25



3602

Old No.
3602—152 **"DREXEL,"** containing:
1 Compass, No. 3408, 3½ inches, with fixed Needle Point, Pen and Pencil parts, and Lengthening Bar,
1 Ruling Pen, No. 3540, 4½ inches, with Spring, Ebony Handle,
1 Box of Leads . . . . . each, $7 50

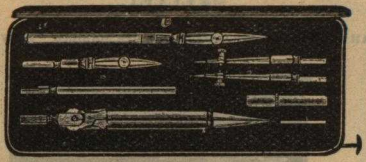


3604

Old No.
3604—156 **"DREXEL,"** containing:
1 Compass, No. 3400, 3½ inches, with fixed Pencil and Needle Point parts,
1 Compass, No. 3402, 3½ inches, with fixed Pen and Needle Point parts,
1 Ruling Pen, No. 3540, 4½ inches, with Spring, Ebony Handle,
1 Box of Leads . . . . . each, $9 75

RIEFLER'S INSTRUMENTS—Continued

All Genuine Riefler Instruments are Stamped "F. W. & Co."



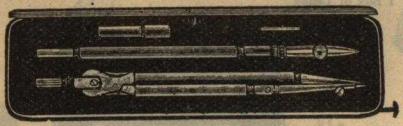
Old No. 3606

3606—154 Containing:

1 Compass, No. 3413, 3½ inches, with Pen, Pencil and Needle Point parts, and Lengthening Bar,

1 Ruling Pen, No. 3540, 4 inches, with Spring, Ebony Handle,

1 Box of Leads . . . . . each, $8 00

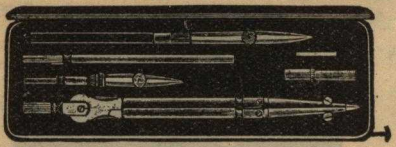


Old No. 3608

3608—160 **"YALE,"** containing:

1 Compass, No. 3422. 5½ inches, with fixed Needle Point, Pen and Pencil parts, Lengthening Bar with milled edge to use as a handle for pen part,

1 Box of Leads . . . . . each, $7 00



Old No. 3610

3610—162 **"HAVERFORD,"** containing:

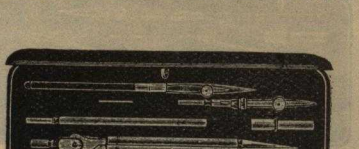
1 Compass, No. 3422, 5½ inches, with fixed Needle Point, Pen and Pencil parts, and Lengthening Bar,

1 Ruling Pen, No. 3542, 5½ inches, with Spring, Ebony Handle,

1 Box of Leads . . . . . each, $8 75

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."



3612

Old No.

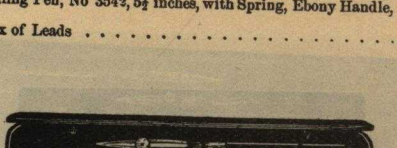
3612—164 Containing:

1 Compass, No. 3422, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar,

1 Plain Divider, No. 3418, 5 inches,

1 Ruling Pen, No 3542, 5½ inches, with Spring, Ebony Handle,

1 Box of Leads . . . . . each, $11 00



3614

Old No.

3614—166 **"UNIVERSITY,"** containing:

1 Compass, No. 3422, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar,

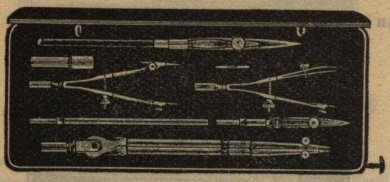
1 Steel-spring Bow Pen, No. 3461, 3 inches, with Needle Point,

1 Ruling Pen, No. 3542, 5½ inches, with Spring, Ebony Handle,

1 Box of Leads . . . . . each, $11 25

RIEFLER'S INSTRUMENTS—Continued.

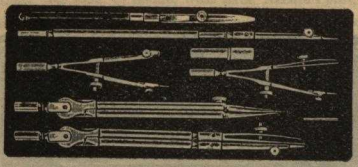
All Genuine Riefler Instruments are Stamped "F. W. & Co."



Old No. 3616

3616—168 **"COLLEGE,"** containing:

1 Compass, No. 3422, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar,
1 Steel-spring Bow Pen, No. 3461, 3 inches, with Needle Point,
1 " " Pencil, No. 3462, 3 " " " "
1 Ruling Pen, No. 3542, 5½ inches, with Spring, Ebony Handle,
1 Box of Leads . . . . . each, $13 25



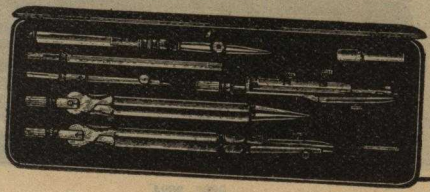
Old No. 3618

3618—171 **"PRINCETON,"** containing:

1 Compass, No. 3422, 5½ inches, with fixed Needle Point, Pen and Pencil parts, and Lengthening Bar,
1 Hairspring Divider, No. 3420, 5 inches,
1 Steel-spring Bow Pen, No. 3461, 3 inches, with Needle Point,
1 " " Pencil, No. 3462, 3 " " " "
1 Ruling Pen, No. 3541, 5 inches, with Spring,
1 Box of Leads . . . . . each, $17 00

RIEFLER'S INSTRUMENTS—Continued.

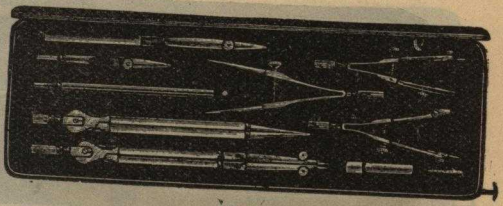
All Genuine Riefler Instruments are Stamped "F. W. & Co."



Old No. 3620

3620—170 **"LAFAYETTE,"** containing

1 Compass, No. 3422, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar,
1 Plain Divider, No. 3418, 5 inches,
1 Adjustable Bow Pen, No. 3490,
1 Ruling Pen, No. 3542, 5½ inches, with Spring, Ebony Handle,
1 Box of Leads . . . . . each, $14 40



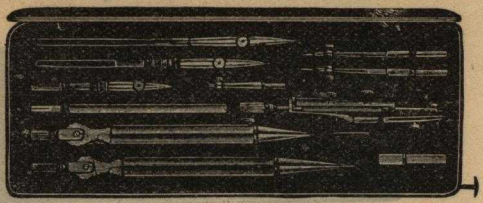
Old No. 3622

3622—172 **"LEHIGH,"** containing:

1 Compass, No. 3422, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar,
1 Plain Divider, No. 3418, 5 inches,
1 Steel-spring Bow Divider, No. 3460, 3 inches,
1 " " Pen, No. 3461, 3 inches, with Needle Point,
1 " " Pencil, No. 3462, 3 " " " "
1 Ruling Pen, No. 3542, 5½ inches, with Spring, Ebony Handle,
1 Box of Leads . . . . . each, $18 00

RIEFLER'S INSTRUMENTS—Continued.

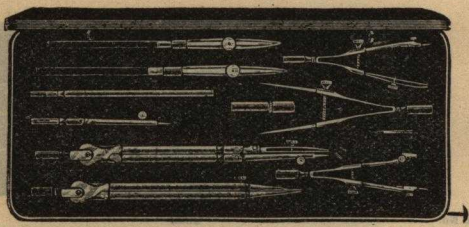
All Genuine Riefler Instruments are Stamped "F. W. & CO."



Old No. 3624

3624—174 **"WISCONSIN,"** containing:

1 Compass, No. 3424, 5½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar,
1 Hairspring Divider, No. 3420, 5 inches,
1 Adjustable Bow Pen, No. 3491, with Pencil parts,
1 Ruling Pen, No. 3542, 5½ inches, with Spring, Ebony Handle,
1 " " No. 3541, 5 " " " " "
1 Box of Leads . . . . . each, $19 50



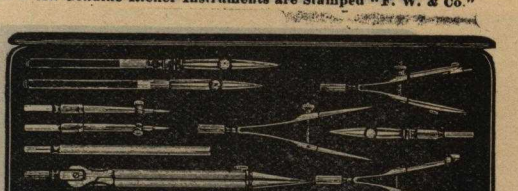
Old No. 3625

3625—175 **"TECHNOLOGY,"** containing:

1 Compass, No. 3422, 5½ inches, with fixed Needle Point, Pen and Pencil parts, and Lengthening Bar,
1 Hairspring Divider, No. 3420, 5 inches,
1 Steel-spring Bow Divider, No. 3460, 3 inches,
1 " " Pen, No. 3461, 3 inches, with Needle Point,
1 " " Pencil, No. 3462, 3 inches, " "
1 Ruling Pen, No. 3542, 5½ inches, with Spring, Ebony Handle,
1 " " No. 3541, 5 " " " " "
1 Box of Leads . . . . . each, $20 00

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."



3626

Old No.

3626—176 **"COLUMBIA,"** containing:

1 Compass, No. 3424, 5½ inches, with Pen, Pencil and Needle Point parts, and Lengthening Bar,
1 Hairspring Divider, No. 3420, 5 inches,
1 Steel-spring Bow Divider, No. 3460, 3 inches,
1 " " Pen, No. 3461, 3 inches, with Needle Point,
1 " " Pencil, No. 3462, 3 inches, " " "
1 Ruling Pen, No. 3542, 5½ inches, with Spring, Ebony Handle,
1 " " No. 3541, 5 " " " " "
1 Box of Leads . . . . . each, $21 50

3628

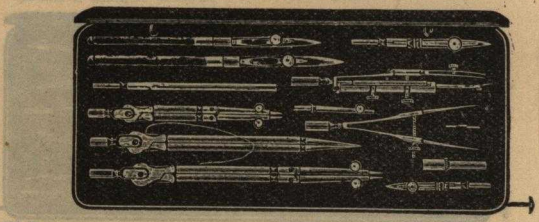
Old No.

3628—178 **"HARVARD,"** containing:

1 Compass, No. 3422, 5½ inches, with fixed Needle Point, Pen and Pencil parts, and Lengthening Bar.
1 Plain Divider, No. 3418, 5 inches,
1 Steel-spring Bow Divider, No. 3460, 3 inches,
1 " " Pen, No. 3461, 3 inches, with Needle Point,
1 " " Pencil, No. 3462, 3 inches, " " "
1 Ruling Pen, No. 3542, 5½ inches, with Spring, Ebony Handle,
1 " " No. 3540, 4½ " " " " "
1 Dotting Pen, No. 3575, with 4 wheels, Pen part to fit Divider for drawing circles,
1 Box of Leads . . . . . each, $23 25

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."

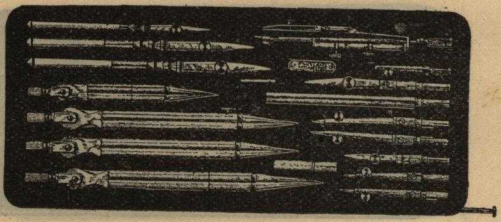


3630

Old No.

3630—180 Containing:

1 Compass. No. 3422, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar,
1 Compass, No. 3404, 3½ inches, with fixed Needle Point, Pen and Pencil parts,
1 Plain Divider, No. 3418, 5 inches,
1 Steel-spring Bow Divider, No. 3460, 3 inches,
1 Adjustable Bow Pen, No. 3491, with Pencil parts,
1 Ruling Pen, No. 3542, 5½ inches with Spring, Ebony Handle,
1 " " No. 3541, 5 " " " " " "
1 Box of Leads . . . . . each, $24 00



3632

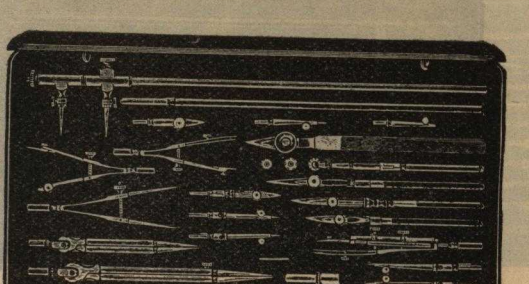
Old No.

3632—182 Containing:

1 Compass, No. 3424, 5½ inches, with Pen, Pencil and Needle Point parts, and Lengthening Bar,
1 Compass, No. 3412, 3½ inches, with Pen, Pencil and Needle Point parts,
1 Plain Divider, No. 3418, 5½ inches,
1 Hairspring Divider, No. 3420, 5 inches,
1 Adjustable Bow Pen, No. 3491, with Pencil part,
1 Ruling Pen, No. 3542, 5½ inches, with Spring, Ebony Handle,
1 " " No. 3540, 4½ " " " " "
1 " " 5 inches, No. 3548, with Joint and Needle,
1 Box of Leads . . . . . each, $28 25

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."



3636

Old No.

3636—184 Containing:

1 Compass, No. 3424, 5½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar,

1 Compass, No. 3412, 3½ inches, with Pen, Pencil and Needle Point parts,

1 Hairspring Divider, No. 3420, 5 inches,

1 Steel-spring Bow Divider, No. 3460, 3 inches,

1 " " Pen, No. 3461, 3 " with Needle Point,

1 Steel-spring Bow Pencil, No. 3462, 3 inches, with Needle Point,

1 Adjustable Bow Pen, No. 3490,

1 Beam Compass, No. 3500, 18 inches, with 2 Bars, Micrometer Attachment, Pen, Pencil and Needle Point parts,

1 Swedish Ruling Pen, No 3566, 6 inches,

1 Ruling Pen, No. 3548, 5 inches, with Joint and Needle,

1 " " " 3542, 5½ " " Spring, Ebony Handle,

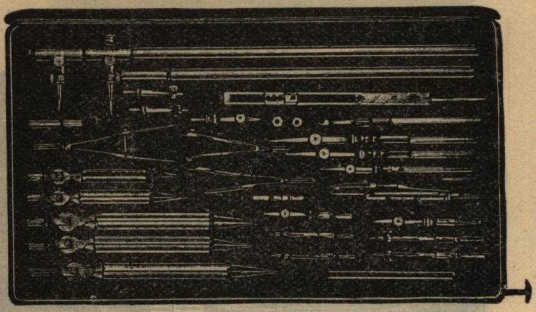
1 " " " 3540, 4½ " " " " "

1 Dotting " " 3575, 3 Wheels, Pen part to fit Divider for drawing circles,

1 Box of Leads . . . . . each, $46 00

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."



Old No. 3638

3638—186 Containing:

1 Compass, No. 3424, 5½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bars,

1 Compass, No. 3412, 3½ inches, with Pen, Pencil and Needle Point parts,

1 Plain Divider, No. 3416, 3½ inches,

1 " " " 3418, 5 "

1 Hairspring Divider, " 3420, 5 "

1 Proportional " " 3442, 7 "

1 Steel-spring Bow Divider, No. 3460, 3 inches,

1 Steel-spring Bow Pen, No. 3461, 3 inches, with Needle Point,

1 " " Pencil, No. 3462, 3 " " " "

1 Adjustable Bow Pen, 3491, with Pencil parts,

1 Beam Compass, No. 3500, 18 inches, with 2 Bars, Micrometer Attachment, Pen, Pencil and Needle Point parts,

1 Ruling Pen, No. 3548, 5 inches, Ebony Handle, with Joint and Needle.

1 Ruling Pen, No. 3542, 5½ inches, with Spring, Ebony Handle.

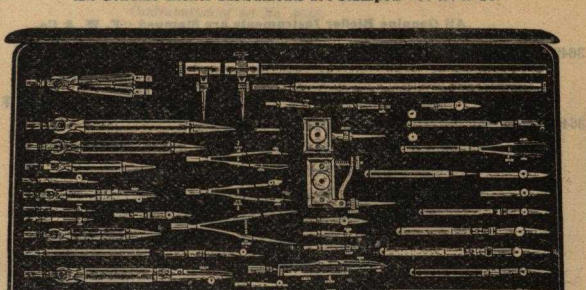
1 " " " 3540, 4½ " " " " "

1 Dotting " " 3575, with 3 Wheels, Pen parts to fit Divider for drawing circles,

1 Box of Leads . . . . . each, $60 00

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."



Old No. 3640

3640—190 Containing:

1 Compass, No. 3424, 5½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar,
1 Compass, No. 3422 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar,
1 Compass, No. 3412, 3½ inches, Pen, Pencil and Needle Point parts,
1 Compass, No. 3404, 3½ inches, with fixed Needle Point, Pen and Pencil parts,
1 Plain Divider, 5½ inches, No. 3419,
1 " " 5 " " 3418,
1 " " 3½ " " 3416,
1 Pocket Divider, No. 3428, with Pen and Pencil parts,
1 Steel-spring Bow Divider, No. 3460, 3 inches,
1 " " Pen, " 3461, 3 inches, with Needle Point,
1 Steel-spring Bow Pencil, No 3462, 3 inches, with Needle Point.
1 Adjustable " Pen, " 3490,
1 " " " " 3491, with Pencil part,
1 Proportional Divider, No. 3442, 7 inches,
1 Tubular Beam Compass, No. 3500, 18 inches, with 2 Bars, Micrometer Attachment, Pen, Pencil and Needle Point parts,
1 Beam Compass, No. 3510, with Pen, Pencil and Needle Point parts,
1 Ruling Pen, No. 3542, 5½ inches, with Spring, Ebony Handle,
1 " " " 3541, 5 " " " " "
1 " " " 3540, 4½ " " " " "
1 " " " 3551, 5½ " " Joint, Ivory "
1 " " " 3549, 5 " " " " "
1 " " " 3547, 4½ " " " " "
1 Hatching Pen, No. 3555, Ivory Handle, with Needle Point,
1 Extra Pen for Hatching Pen, No. 3557,
1 Railroad Pen, No. 3585, 5½ inches, Ebony Handle,
1 Dotting Pen, No. 3570, 3 Wheels, Ivory Handle,
1 Box of Leads . . . . . each, $100 00

RIEFLER'S INSTRUMENTS—Continued.

All Genuine Riefler Instruments are Stamped "F. W. & Co."

3642 Containing:

Same Assortment as No 3640, in open wooden tray, velvet lined with cover . . . . . each, $ 97 00

3645 Open tray, velvet lined and cover. Containing:

1 Compass, No. 3424, 5½ inches, with Pen, Pencil and Needle Point parts, and Lengthening Bar,

1 Compass, No 3422, 5½ inches, with fixed Needle Point, Pen and Pencil parts, and Lengthening Bar,

1 Compass, No. 3413, 3½ inches, with Pen, Pencil and Needle Point parts, and Lengthening Bar,

1 Compass, No. 3412, 3½ inches, with Pen, Pencil and Needle Point parts

1 Compass, No. 3404, 3½ inches, with fixed Needle Point, Pen and Pencil parts,

1 Plain Divider, No 3416, 3½ inches,

1 " " No 3418, 5 "

1 " " No. 3419, 5½ "

1 Hairspring Divider, No. 3420, 5 inches,

1 Pocket Divider, No. 3428, with Pen and Pencil part,

1 Steel-spring Bow Divider, No. 3460, 3 inches,

1 " " Pen, No. 3461, 3 inches, with Needle Point,

1 " " Pencil, No. 3462, 3 inches, " " "

1 Adjustable Bow Pen, No. 3490,

1 " " " No. 3491, with Pencil part,

1 Proportional Divider, No. 3442, 7 inches,

1 " " No. 3144, 8 inches, for lines from ½½ to 10,

1 Micrometer Attachment, No. 3552,

1 Whole and Half Divider, No. 3436, 7¾ inches,

1 Tubular Beam Compass, No. 3500, 18 inches, with 2 Bars, Micrometer Attachment, Pen, Pencil and Needle Point parts,

1 Tubular Beam Compass, No. 3502, 25 inches, with 3 Bars, Micrometer Attachment, Pen, Pencil and Needle Point parts,

1 Tubular Beam Compass, No. 3504, 39 inches, with 3 Bars, Improved Micrometer Attachment, Pen, Pencil and Needle Point parts,

1 Beam Compass, No. 3510, with Improved Micrometer Attachment, Pen, Pencil and Needle Point parts,

RIEFLER'S INSTRUMENTS—Continued.

Continuation of set No. 3645.

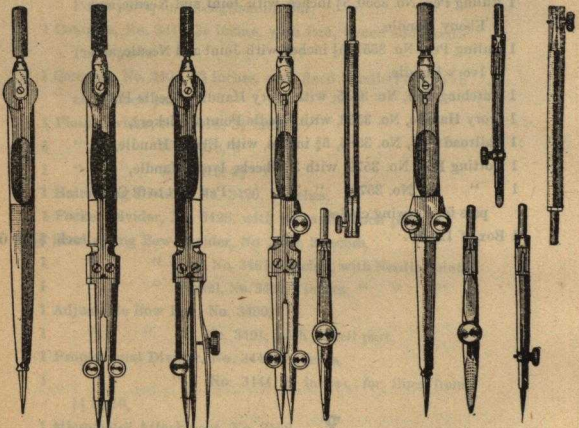
1 Ruling Pen, No. 3540, 4½ inches, with Spring, Ebony Handle,
1 " " No. 3541, 5 " " " " "
1 " " No. 3542, 5½ " " " " "
1 " " No. 3546, 4½ " " Joint, " "
1 " " No. 3547, 4½ " " " Ivory "
1 " " No. 3548, 5 " " Joint and Needle, and Ebony Handle,
1 Ruling Pen, No. 3549, 5 inches, with Joint and Needle, and Ivory Handle,
1 Ruling Pen, No. 3550, 5½ inches, with Joint and Needle, and Ebony Handle,
1 Ruling Pen, No. 3551, 5½ inches, with Joint and Needle, and Ivory Handle,
1 Hatching Pen, No. 3555, with Ivory Handle, Needle Point,
1 Ivory Handle, No. 3558, with Needle Point (Pricker),
1 Railroad Pen, No. 3585, 5¾ inches, with Ebony Handle,
1 Dotting Pen, No. 3570, with 3 Wheels, Ivory Handle,
1 " " No. 3575, " 3 " Pen part to fit Compass for drawing circles,
1 Box of Leads . . . . . each, $160 00

"SPHINX" GERMAN-SILVER INSTRUMENTS.

SWISS PATTERN, WITH PIVOT JOINT.

SUPERFINE QUALITY.

Illustrations, $\frac{2}{3}$ size.

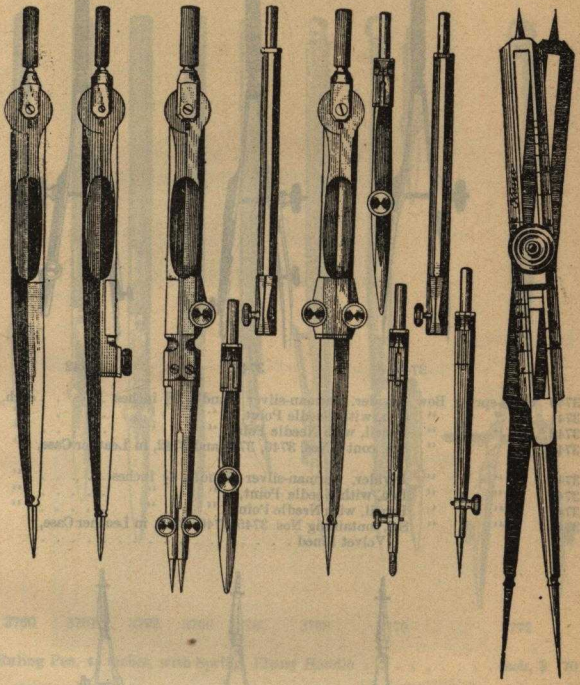


3700 3702 3703 3705 3708

3700	Plain Divider, 3½ inches	each, $1 20
3702	Compass, 3½ inches, with fixed Needle Point and fixed Pencil part	" 2 75
3703	" 3½ " " " " " " " " Pen "	" 2 75
3705	" 3½ " " " Needle Point, Pen and Pencil parts, and Lengthening Bar	" 4 00
3708	" 3½ " " " Pen, Pencil and Needle Point parts, and Lengthening Bar	" 4 40

"SPHINX" INSTRUMENTS—Continued.

Illustrations, ⅔ size.

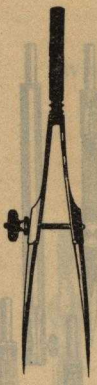


3710 3712 3714 3716 3720

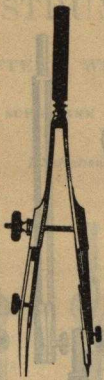
3710	Plain Divider, 5 inches	each, $1 40
3712	Hairspring Divider, 5 inches	" 2 40
3714	Compass, 5½ inches, with fixed Needle Point, Pen and Pencil Point, and Lengthening Bar	" 4 00
3715	" 5½ " the same as No. 3714, with Hairspring Attachment,	" 5 00
3716	" 5½ " " Pen, Pencil and Needle Point parts, and Lengthening Bar	" 5 50
3720	Proportional Divider, 7 inches, for lines and circles	" 8 00

"SPHINX" INSTRUMENTS—Continued.

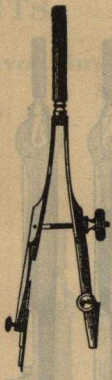
Illustrations ⅔ size.



3740



3741



3742

3740	Steel-spring Bow		Divider. German-silver Handle, 3¾ inches	each,	$1 20
3741	"	"	Pen, with Needle Point, " "	"	1 50
3742	"	"	Pencil, with Needle Point, " "	"	1 50
3743	"	"	Set, cont'g Nos. 3740, 3741 and 3742, in Leather Case,	"	5 00
3745	"	"	Divider, German-silver Handle, 4½ inches	"	2 00
3746	"	"	Pen, with Needle Point, " "	"	2 50
3747	"	"	Pencil, with Needle Point, " "	"	2 50
3748	"	"	Set, containing Nos 3745, 3746, 3747, in Leather Case, Velvet Lined		8 00

3750

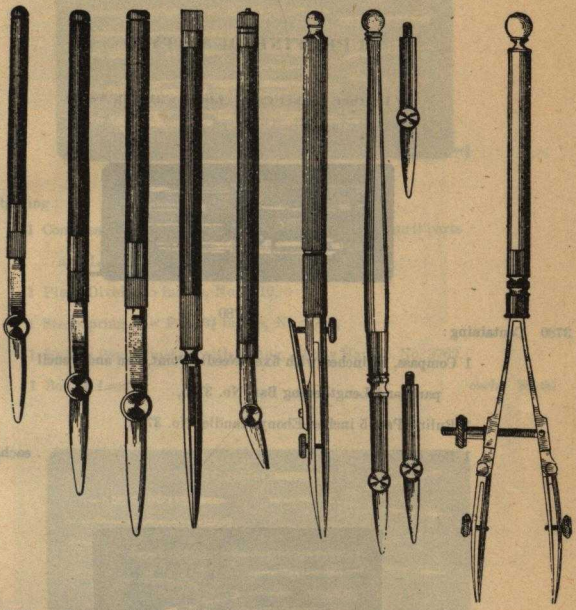
3751

3752

3750	Miniature Steel-spring Bow		Divider, German-silver Handle, 2 inches . .	each,	$1 50
3751	"	"	Pen, " " 2 " . .	"	1 80
3752	"	"	Pencil, " " 2 " . .	"	1 80
3753	"	"	Set, containing Nos. 3750, 3751 and 3752, in Leather Case, Velvet Lined	"	5 75

"SPHINX" INSTRUMENTS—Continued.

Illustrations ⅜ size.



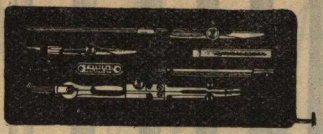
3760 3761 3762 3766 3767 3768 3770 3772

3760	Ruling Pen, 4½ inches, with Spring, Ebony Handle . . . . . each,	$ 70
3761	" " 5 " " " " " "	75
3762	" " 5½ " " " " " "	80
3766	Wedge " 5½ " " Metal Handle . . . . . "	1 50
3767	Curve " 4½ " " " " . . . . . "	1 50
3768	Duplex Ruling Pen, 5 inches and 5½ Aluminum Handle . . . . . "	2 50
3769	Hatching Pen, 5½ inches, Ebony Handle . . . . . "	75
3770	" " 5 " " " with 2 extra Pens in Case . . "	2 00
3772	Railroad Pen, with Hinges, 6 inches, Ivory Handle . . . . . "	2 75

"SPHINX" GERMAN-SILVER INSTRUMENTS.

SUPERFINE QUALITY.

In Leather Pocket Cases, Lined with Silk Velvet.



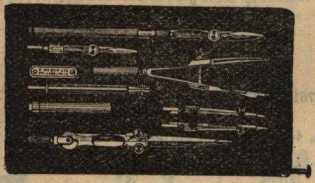
3780

3780 **Containing:**

1 Compass, 3½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3705,

1 Ruling Pen, 5 inches, Ebony Handle, No. 3761,

1 Box of Leads . . . . . each, $5 30



3782

3782 **Containing:**

1 Compass, 3½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar, No. 3708,

1 Ruling Pen, 5 inches, with Spring, Ebony Handle, No. 3761,

1 Steel-spring Bow Pen, 3¾ inches, No. 3741,

1 Box of Leads . . . . . each, $6 85

"SPHINX" INSTRUMENTS—Continued.

3784

3784 Containing:

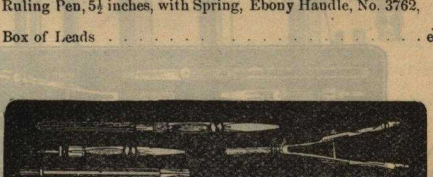
1 Compass, 5½ inches, fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3714,

1 Plain Divider, 5 inches, No. 3710,

1 Steel-spring Bow Pen, 3¾ inches, No. 3741,

1 Ruling Pen, 5½ inches, with Spring, Ebony Handle, No. 3762,

1 Box of Leads . . . . . each, $8 00



3785

3785 Containing:

1 Compass, 5½ inches, fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3714,

1 Plain Divider, 5 inches, No. 3710,

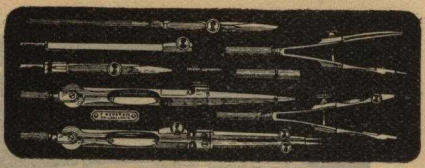
1 Steel-spring Bow Pen, 3¾ inches, No. 3741,

1 " " Pencil, 3¾ inches, No. 3742,

1 Ruling Pen, 5½ inches, with Spring, Ebony Handle, No. 3762,

1 Box of Leads . . . . . each, $9 00

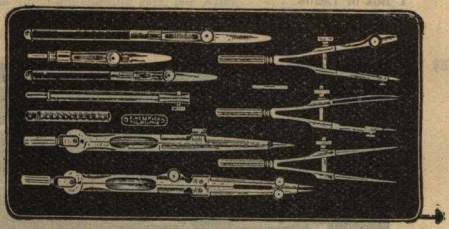
"SPHINX" INSTRUMENTS—Continued.



3786

3786 Containing:

1 Compass, 5½ inches, fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3714,
1 Hairspring Divider, No. 3712,
1 Steel-spring Bow Pen, 3¾ inches, No. 3741,
1 " " Pencil, 3¾ inches, No. 3742,
1 Ruling Pen, 5 inches, with Spring, Ebony Handle, No. 3761,
1 Box of Leads . . . . . each, $10 00



3790

3790 Containing:

1 Compass, 5½ inches, fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3714,
1 Hairspring Divider, 5 inches, No. 3712,
1 Steel-spring Bow Divider, 3¾ inches, No. 3740,
1 " " Pen, 3¾ " " 3741,
1 " " Pencil, 3¾ " " 3742,
1 Ruling Pen, 4½ inches, with Spring, Ebony Handle. No. 3760,
1 " " 5½ " " " " " " 3762,
1 Box of Leads . . . . . each, $11 50

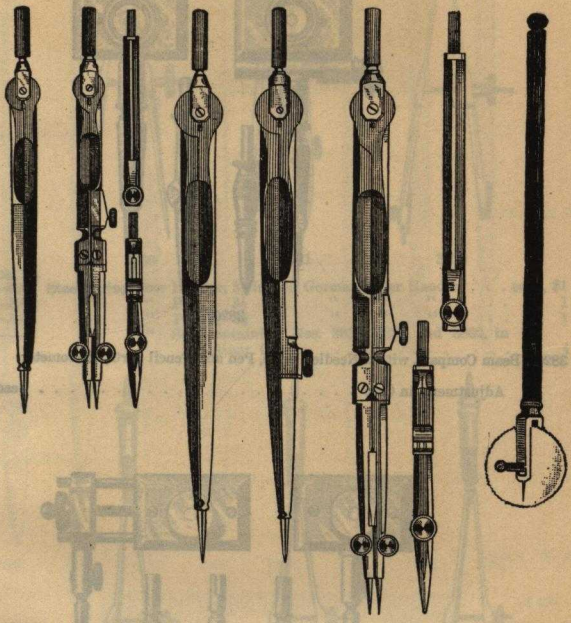
"COSMOS"

GERMAN-SILVER INSTRUMENTS.

SWISS PATTERN WITH PIVOT JOINT.

FINE QUALITY.

Illustrations ⅔ size.

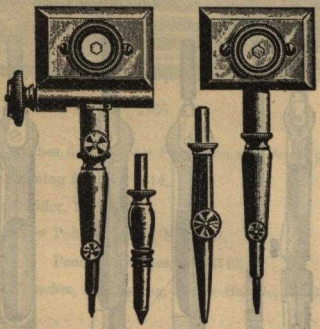


3800 3802 3804 3805 3808 3810

3800	Plain Divider, 3½ inches	each,	$1 00
3802	Compass, 3½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar	"	2 80
3803	Compass, 3½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar	"	3 40
3804	Plain Divider, 5 inches	"	1 10
3805	Hairspring Divider, 5 inches	"	2 10
3808	Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar	"	2 75
3810	Opisometer for Measuring Curved Lines	"	1 75

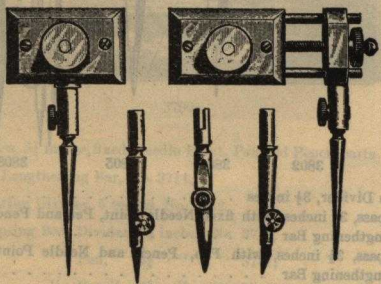
"COSMOS" INSTRUMENTS—Continued.

Illustrations ⅔ size.



3820

3820 Beam Compass, with 2 Needle Points, Pen and Pencil parts, Micrometer Adjustment, in Case . . . . . each, $5 50

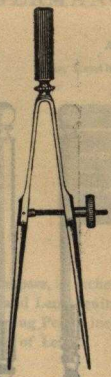


3822

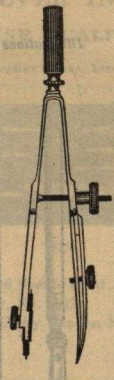
3822 Beam Compass, with 2 Steel Points, Pen, Pencil and Needle Point parts, Micrometer Adjustment, in Case . . . . . each, $7 00

"COSMOS" INSTRUMENTS—Continued.

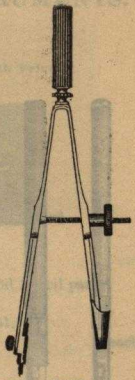
Illustrations ⅔ size.



3830

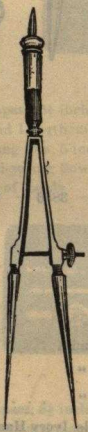


3831

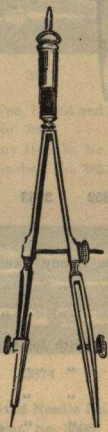


3832

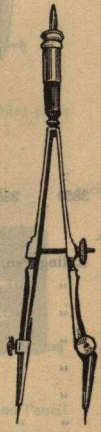
Old No.				
3830—580	Steel-spring Bow Divider, 3½ inches, German-silver Handle . . .	each,	$1	00
3831—581	" " Pen, 3½ " " " " " . . .	"	1	25
3832—582	" " Pencil, 3½ " " " " " . . .	"	1	25
3833——	" " Set, containing Nos. 3830, 3831 and 3832, in Leather Case	"	4	25



3835



3836

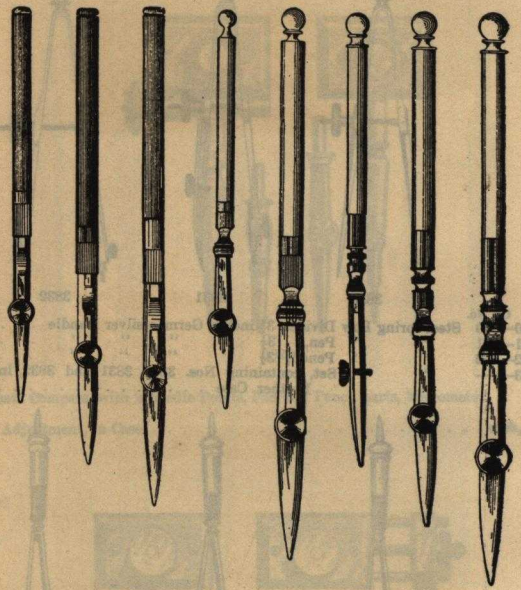


3837

Old No.				
3835—583	Steel-spring Bow Divider, 3½ inches, Ivory Handle	each,	$1	10
3836—584	" " Pen, 3½ " " " "	"	1	35
3837—585	" " Pencil, 3½ " " " "	"	1	35
3838——	" " Set, containing Nos. 3835, 3836 and 3837, in Leather Case	"	4	50

"COSMOS" INSTRUMENTS—Continued.

Illustrations ⅔ size.



3850 3851 3852 3853 3855 3856 3857 3858

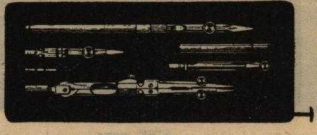
Old No.					
3850—272	Ruling Pen, 4½ inches, Ebony Handle	each, $	50
3851—273	" " 5 " " "	"	55
3852—274	" " 5½ " " "	"	60
3853——	" " 4½ " with Joint, Ivory Handle	"	50
3854—275	" " 5 " " " " "	"	55
3855—276	" " 5½ " " " " "	"	60
3856—280	" " 4½ " " " and Needle, Ivory Handle . .	"	65
3857—281	" " 5 " " " " " " " . .	"	70
3858—282	" " 6 " " " " " " " . .	"	75

"COSMOS"

GERMAN-SILVER INSTRUMENTS.

FINE QUALITY.

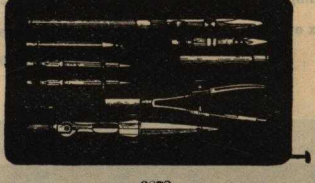
In Leather Pocket Cases, Lined with Velvet.



3870

3870 Containing:

1 Compass, 3½ inches, fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3802,
1 Ruling Pen, 5 inches, Ebony Handle, No. 3851,
1 Box of Leads . . . . . each, $3 65



3872

3872 Containing:

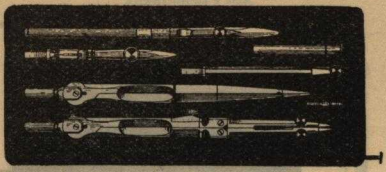
1 Compass, 3½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar, No. 3803,
1 Ruling Pen, 5 inches, Ebony Handle, No. 3851,
1 Steel-spring Bow Pen, 3¾ inches, No. 3831,
1 Box of Leads . . . . . each, $5 30

3874

3874 Containing:

1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3808,
1 Ruling Pen, 5½ inches, Ebony Handle, No. 3852,
1 Box of Leads . . . . . each, $3 65

"COSMOS" INSTRUMENTS—Continued.



3875

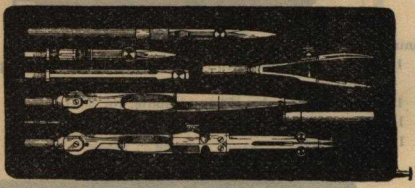
3875 Containing:

1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3808,

1 Plain Divider, 5 inches, No. 3804,

1 Ruling Pen, 5½ inches, Ebony Handle, No. 3852,

1 Box of Leads . . . . . each, $5 00



3876

3876 Containing:

1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3808,

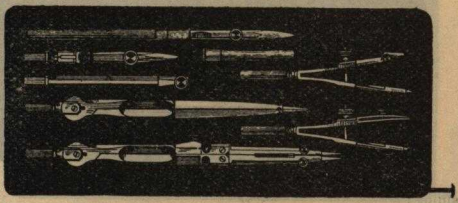
1 Plain Divider, 5 inches, No. 3804,

1 Steel-spring Bow Pen, 3½ inches, No. 3831,

1 Ruling Pen, 5½ inches, Ebony Handle, No. 3852,

1 Box of Leads . . . . . each, $6 00

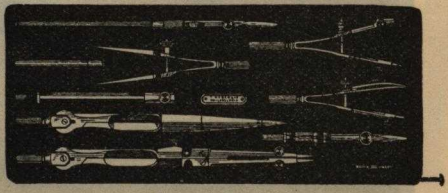
"COSMOS" INSTRUMENTS—Continued.



3878

3878 Containing:

1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3808,
1 Plain Divider, 5 inches, No. 3804,
1 Steel-spring Bow Pen, 3½ inches, No. 3831,
1 " " Pencil, 3½ inches, No. 3832,
1 Ruling Pen, 5½ inches, Ebony Handle, No. 3852,
1 Box of Leads . . . . . each, $7 10

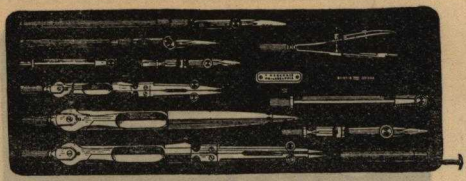


3880

3880 Containing:

1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3808,
1 Plain Divider, 5 inches, No. 3804,
1 Steel-spring Bow Divider, 3½ inches, No. 3830,
1 " " Pen, 3½ " " 3831,
1 " " Pencil, 3½ " " 3832,
1 Ruling Pen 5½ inches, Ebony Handle, No. 3852,
1 Box of Leads . . . . . each, $8 40

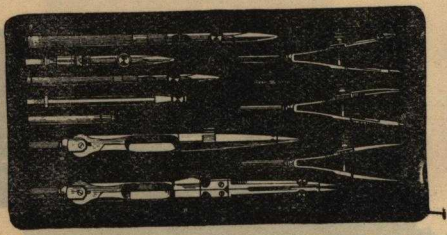
"COSMOS" INSTRUMENTS—Continued.



3882

3882 Containing:

1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3808,
1 Plain Divider, 5 inches, No. 3804,
1 Compass, 3½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3802,
1 Steel-spring Bow Pen, 3½ inches, No. 3831,
1 Ruling Pen, 4½ inches, Ebony Handle, No. 3850,
1 " " 5½ " " " " 3852,
1 Box of Leads . . . . . each, $10 00

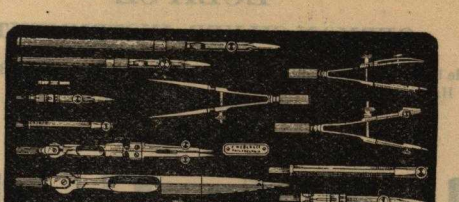


3884

3884 Containing:

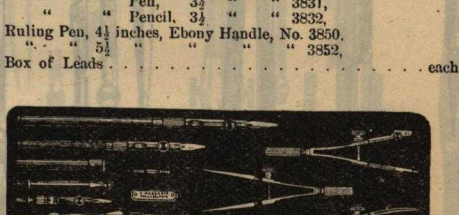
1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3808,
1 Hairspring Divider, 5 inches, No. 3805,
1 Steel-spring Bow Divider, 3½ inches, No. 3830,
1 " " Pen, 3½ " " 3831,
1 " " Pencil, 3½ " " 3832,
1 Ruling Pen, 4½ inches, Ebony Handle, No. 3850,
1 " " 5½ " " " " 3852,
1 Box of Leads . . . . . each, $9 25

"COSMOS" INSTRUMENTS—Continued.



3886

3886 Containing:
1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3808,
1 Plain Divider, 5 inches, No 3804,
1 Compass, 3½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No 3802,
1 Steel spring Bow Divider, 3½ inches, No. 3830,
1 " " Pen, 3½ " " 3831,
1 " " Pencil, 3½ " " 3832,
1 Ruling Pen, 4½ inches, Ebony Handle, No. 3850,
1 " " 5½ " " " " 3852,
1 Box of Leads . . . . . each, $12 00



3888

3888 Containing:
1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3808,
1 Hairspring Divider, 5 inches, No. 3805,
1 Plain " 5 " " 3804,
1 Compass, 3½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3802,
1 Steel-spring Bow Divider, 3½ inches, No. 3830,
1 " " Pen, 3½ " " 3831,
1 " " Pencil, 3½ " " 3832,
1 Ruling Pen, 4½ inches, Ebony Handle, No. 3850,
1 " " 5½ " " " " 3852,
1 Box of Leads . . . . . each, $14 50

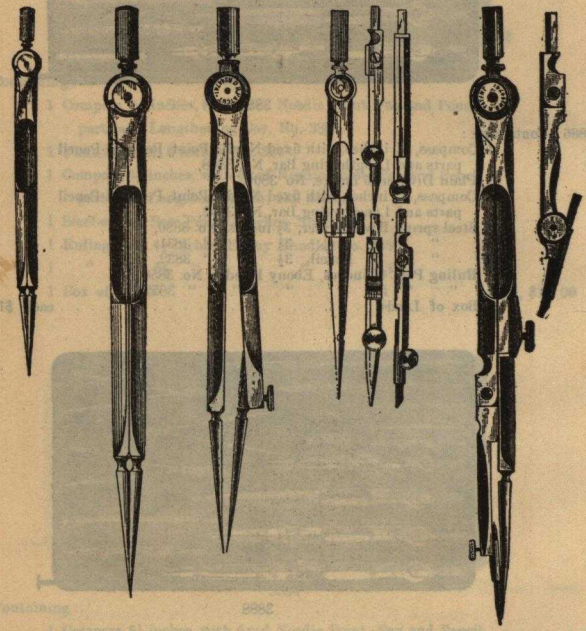
"ECLIPSE"

GERMAN-SILVER INSTRUMENTS.

Made by the Improved Pattern, with Round Steel Points, Patent Ball Joint and Handles

FINE SCHOOL QUALITY.

Illustrations ⅔ size.

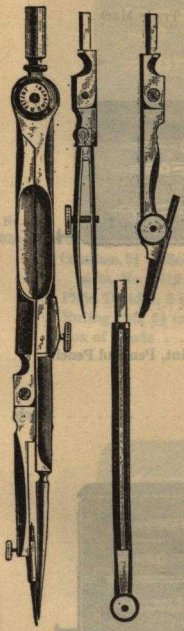


3900 3901 3903 3906 3910

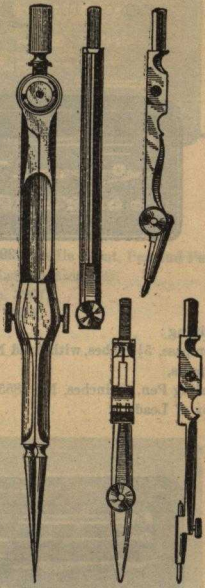
Old No.			
3900——	Plain Divider, 3½ inches	each, $	50
3901——	" " 5 "	"	60
3902——	" " 6½ "	"	70
3903—300½	Hairspring Divider, 5½ inches	"	70
3905——	Compass, 3½ inches, same as No. 3906, without Lengthening Bar,	"	2 75
3906——	" " with Pen, Pencil and Needle Point parts and Lengthening Bar	"	3 00
3910—364	Compass, 5½ inches, with fixed Needle Point and Pencil parts	"	1 25

"ECLIPSE" INSTRUMENTS - Continued.

Illustrations ⅔ size.



3912



3913

3920

Old No.

3912—367 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar . . . . . each, $2 00

3913—366 Compass, 5½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar . . . . . " 2 50

3920 Proportional Divider, 6 inches, Nickel Plated, in Case . . . . . " 2 50

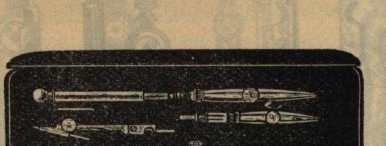
"ECLIPSE"

GERMAN-SILVER INSTRUMENTS.

In Cases, Leather Covered and Velvet Lined.

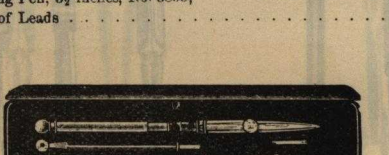
FINE SCHOOL QUALITY.

Each Case bears our Trade Mark.



3950

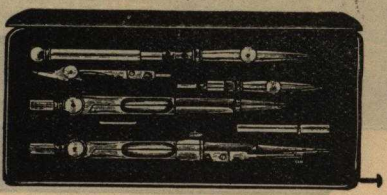
Old No.
3950—301*a* Containing:
1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts,
1 Ruling Pen, 5½ inches, No. 3855,
1 Box of Leads . . . . . each, $2 50



3951

Old No.
3951—302*a* Containing:
1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3912,
1 Ruling Pen, 6 inches, No. 3855,
1 Box of Leads . . . . . each, $2 65

"ECLIPSE" INSTRUMENTS—Continued.

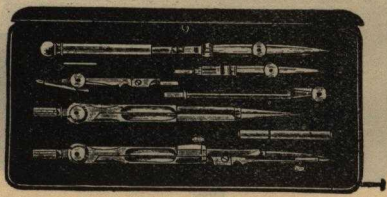


3952

Old No.

3952—303a Containing:

1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts, No. 3912 without Lengthening Bar,
1 Plain Divider, 5 inches, No. 3901,
1 Ruling Pen, 5½ inches, No. 3855,
1 Box of Leads . . . . . each, $3 00



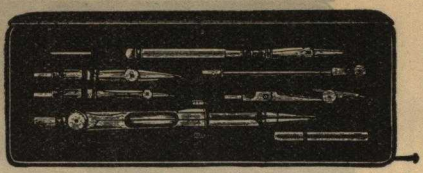
3953

Old No.

3953—304a Containing:

1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3912,
1 Plain Divider, 5 inches, No. 3901,
1 Ruling Pen, 5½ inches, No. 3855,
1 Box of Leads . . . . . each, $3 20

"ECLIPSE" INSTRUMENTS—Continued.



3954

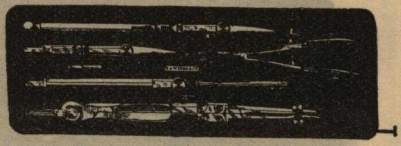
Old No.

3954—356 **Containing:**

1 Compass, 5½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar, No. 3913,

1 Ruling Pen, 5½ inches, No. 3855,

1 Box of Leads . . . . . each, $3 25



3955

3955 **"Industrial Art"—Containing:**

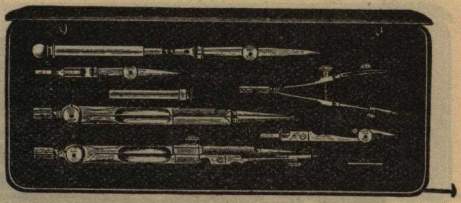
1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3912,

1 Steel-spring Bow Pen, 3½ inches, No. 3831,

1 Ruling Pen, 5 inches, No. 3857,

1 Box of Leads . . . . . each, $4 00

"ECLIPSE" INSTRUMENTS—Continued.

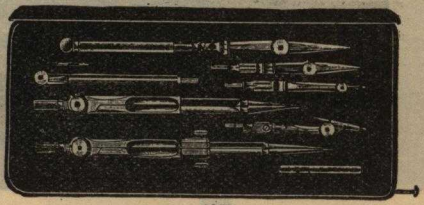


3956

Old No.

3956—305*a* Containing:

1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3912,
1 Plain Divider, 5 inches, No. 3901,
1 Steel-spring Bow Pen, 3½ inches, No. 3831,
1 Ruling Pen, 5½ inches, No. 3855,
1 Box of Leads . . . . . each, $4 25



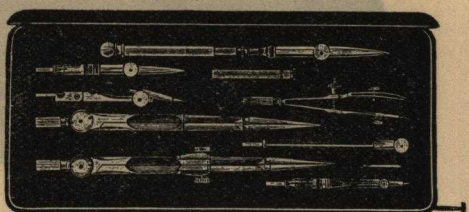
3958

Old No.

3958—306 Containing:

1 Compass, 5½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar, No. 3913,
1 Plain Divider, 5 inches, No. 3901,
1 Ruling Pen, 5½ inches, No. 3855,
1 Box of Leads . . . . . each, $4 00

"ECLIPSE" INSTRUMENTS—Continued.

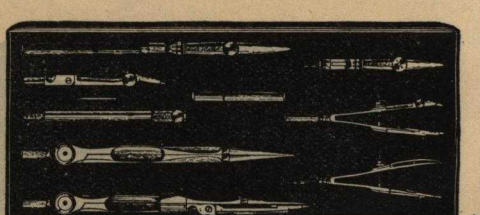


3960

Old No.

3960—307 Containing:

1 Compass, 5½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar, No. 3913,
1 Plain Divider, 5 inches, No. 3901,
1 Steel-spring Bow Pen, 3½ inches, No. 3831,
1 Ruling Pen, 5½ inches, No. 3855,
1 Box of Leads . . . . . each, $5 00



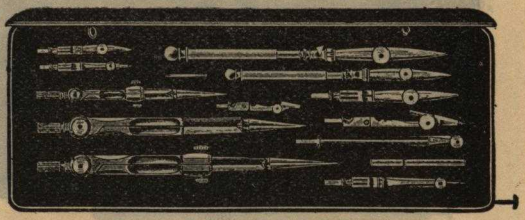
3962

Old No.

3962—308 Containing:

1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar, No. 3912,
1 Plain Divider, 5 inches, No. 3901,
1 Steel-spring Bow Pen, 3½ inches, No. 3831,
1 " " Pencil, 3½ inches, No. 3832,
1 Ruling Pen, 5½ inches, No. 3855,
1 Box of Leads . . . . . each, $5 70

"ECLIPSE" INSTRUMENTS—Continued.

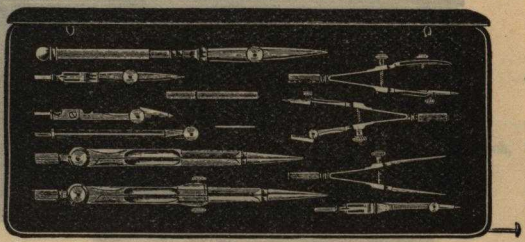


3964

Old No.

3964—309 Containing:

1 Compass, 5½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar, No. 3913,
1 Plain Divider, 5 inches, No. 3901,
1 Compass, 3½ inches, with Pen, Pencil and Needle Point parts, No. 3905,
1 Ruling Pen, 5 inches, No. 3854,
1 " " 5½ " " 3855,
1 Box of Leads . . . . . each, $6 50



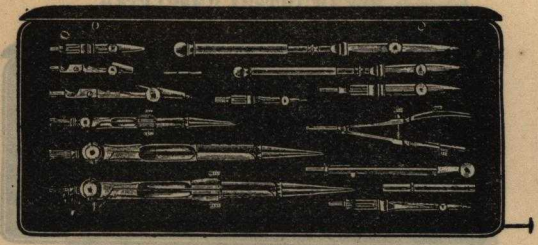
3966

Old No.

3966—320 Containing:

1 Compass, 5½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar, No. 3913,
1 Plain Divider, 5 inches, No. 3901,
1 Steel-spring Bow Divider, 3½ inches, No. 3830,
1 " " Pen, 3½ " " 3831,
1 " " Pencil, 3½ " " 3832,
1 Ruling Pen, 5½ inches, No. 3855,
1 Box of Leads . . . . . each, $6 55

"ECLIPSE" INSTRUMENTS—Continued.

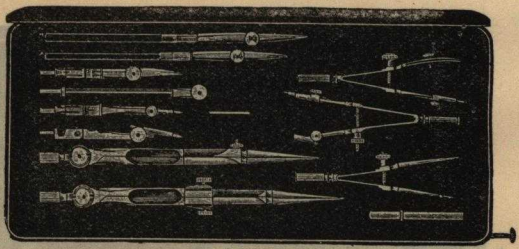


3968

Old No.

3968—310 Containing:

1 Compass, 5½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar, No. 3913,
1 Plain Divider, 5 inches, No. 3901,
1 Compass, 3½ inches, with Pen, Pencil and Needle Point parts, No. 3905,
1 Steel-spring Bow Pen, 3½ inches, No. 3831,
1 Ruling Pen, 5 inches, No. 3854,
1 " " 5½ " " 3855,
1 Box of Leads . . . . . each, $7 50



3970

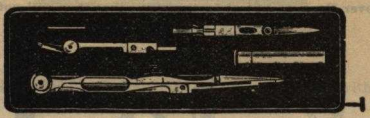
Old No.

3970—322 Containing:

1 Compass, 5½ inches, with Pen, Pencil and Needle Point parts and Lengthening Bar, No. 3913,
1 Hairspring Divider, 5½ inches, No. 3903,
1 Steel-spring Bow Divider, 3½ inches, No. 3830,
1 " " Pen, 3½ " " 3831,
1 " " Pencil, 3½ " " 3832,
1 Ruling Pen, 5 inches, No. 3854,
1 " " 5½ " " 3855,
1 Box of Leads . . . . . each, $8 20

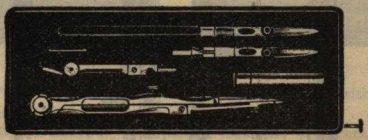
SPECIAL
SCHOOL INSTRUMENTS.

Of German Silver, with Patent Ball Joints,
IN CLOTH-COVERED CASES.



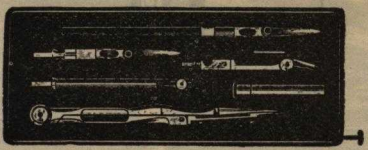
3980

3980 Containing:
1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts,
1 Box of Leads . . . . . each, $1 40



3981

3981 Containing:
1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts,
1 Ruling Pen, 5 inches, with Ebony Handle,
1 Box of Leads . . . . . each, $1 60



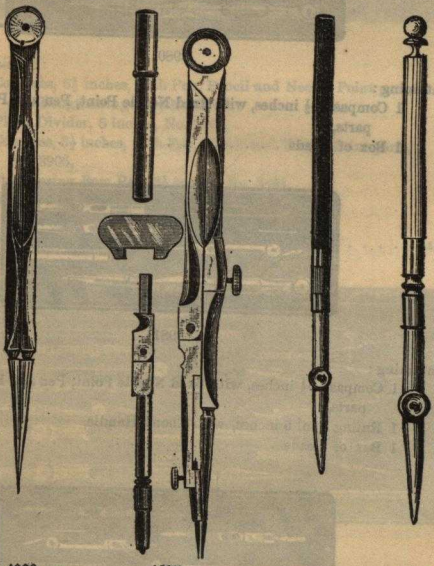
3982

3982 Containing:
1 Compass, 5½ inches, with fixed Needle Point, Pen and Pencil parts and Lengthening Bar,
1 Ruling Pen, 5 inches, with Ebony Handle,
1 Box of Leads . . . . . each, $1 80

NICKEL-PLATED

SCHOOL INSTRUMENTS.

These Instruments are well made, and being Nickel Plated, have the advantage over Brass and Steel Instruments, that they will not rust or tarnish.



4000 4005 4010 4011

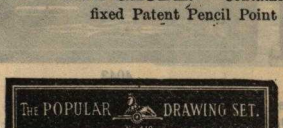
Old No.			
4000—400	Plain Divider, 4½ inches, Round Points	each,	$ 25
4001—401	" " 5½ " " "	"	35
4005—405	Compass, 5½ inches, with fixed Needle Point and Pencil parts and Box of Leads	"	75
4010—420	Ruling Pen, 5 inches, Ebony Handle	"	15
4011—421	" " 5½ " Ivory " with Needle	"	35

NICKEL-PLATED SCHOOL INSTRUMENTS.

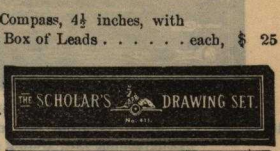
In Paste-Board Slide Cases, Velvet Lined.

4020

Old No.
4020—412 **"THE GLOBE."** Containing Compass, 4½ inches, with fixed Patent Pencil Point and Box of Leads . . . . . each, $ 25



4021

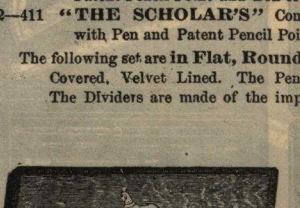


4022

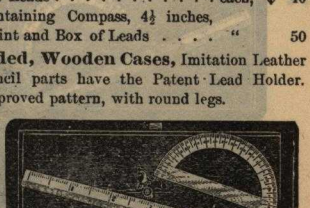
Old No.
4021—410 **"THE POPULAR."** Containing Compass, 4 inches, with Patent Pencil Point and Box of Leads . . . . . each, $ 40

4022—411 **"THE SCHOLAR'S"** Containing Compass, 4½ inches, with Pen and Patent Pencil Point and Box of Leads . . . . " 50

The following set are **in Flat, Rounded, Wooden Cases,** Imitation Leather Covered, Velvet Lined. The Pencil parts have the Patent Lead Holder. The Dividers are made of the improved pattern, with round legs.



4040

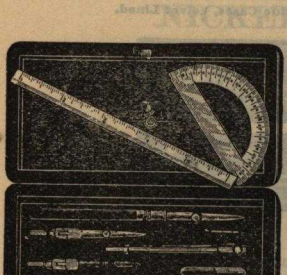


4041

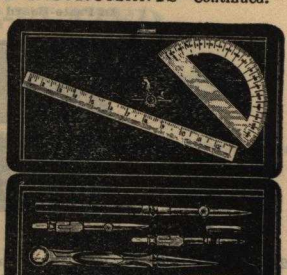
Old No.
4040—440 Containing Compass, 4½ inches, with Pen and Pencil parts, Rule and Box of Leads . . . . . each, $ 70

4041—441 Containing Compass, 4½ inches, with Pen and Pencil parts, Ruling Pen, Rule, Protractor and Box of Leads . . . . . " 85

NICKEL-PLATED SCHOOL INSTRUMENTS—Continued.



4042

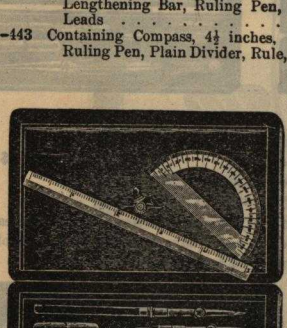


4043

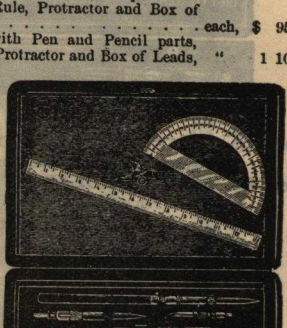
Old No.

4042—442 Containing Compass, 4½ inches, with Pen, Pencil parts and Lengthening Bar, Ruling Pen, Rule, Protractor and Box of Leads . . . . . each, $ 95

4043—443 Containing Compass, 4½ inches, with Pen and Pencil parts, Ruling Pen, Plain Divider, Rule, Protractor and Box of Leads, " 1 10



4044



4045

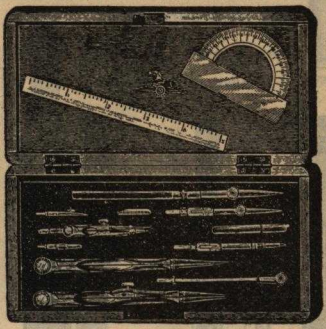
Old No.

4044—444 Containing Compass, 5 inches, with Pen, Pencil parts and Lengthening Bar, Plain Divider, Ruling Pen, Rule, Protractor and Box of Leads . . . . . each, $1 25

4045—445 The same as No. 4044, including Compass, 3½ inches, with fixed Needle Point, Pen and Pencil parts . . . . . " 1 65

4056—456 Containing Compass, 5½ inches, with Pen, Pencil parts and Lengthening Bar, Plain Divider, Ruling Pen, Compass, 3½ inches, with fixed Needle Point, Pen and Pencil parts, Rule, Protractor and Box of Leads (See illustration 4057) . . . . . " 2 10

NICKEL-PLATED SCHOOL INSTRUMENTS—Continued.

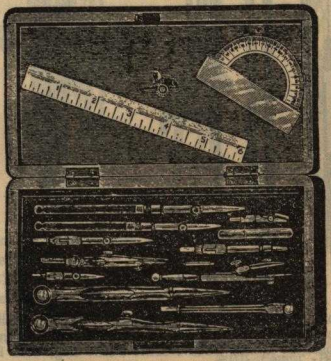


4057

Old No.

4057—457 Containing Compass, 5½ inches, with Pen and Pencil parts and Lengthening Bar, Plain Divider, 4½ inches, Ruling Pen, Compass, 3½ inches, with fixed Needle Point, Pen and Pencil parts, Rule, Protractor and Box of Leads, in imitation Rosewood Case, with Lock and Key . . . . . each, $2 50

4058—458 Containing Compass 5½ inches, with Pen, Pencil parts and Lengthening Bar, Plain Divider, 4½ inches, Compass, 3½ inches, with fixed Needle Point, Pen and Pencil parts, Steel-spring Bow Pen with Needle Point, large and small Ruling Pen, Rule, Protractor and Box of Leads in Pocket Case (See illustration No. 4059) . . . . . " 3 15



4059

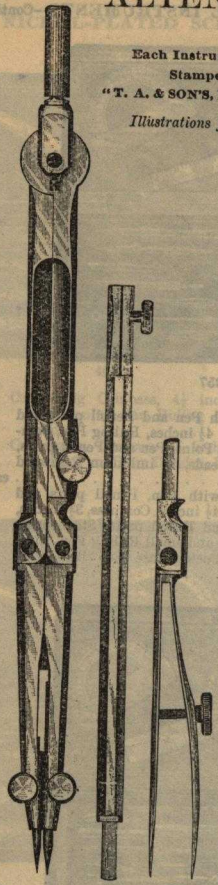
Old No.

4059—459 Same contents as No. 4058, in imitation Rosewood Polished Case, with Lock and Key . . . . . each, $3 75

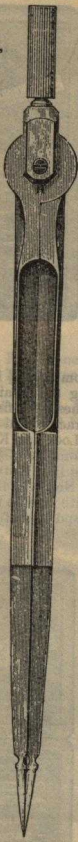
ALTENEDER'S INSTRUMENTS.

Each Instrument is Stamped "T. A. & SON'S, Pat. 1871."

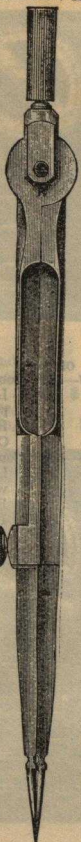
Illustrations full size.



4104



4108

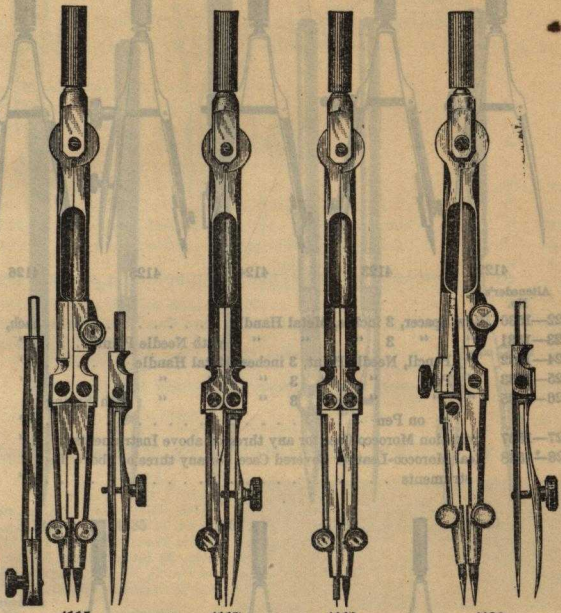


4110

Alteneder's No.		
4100—1400	Compass, 5½ in., fixed Needle Point Leg, with Pencil and Pen parts, each,	$7 00
4101—1401	Same as No. 4100, with Patent Spring Hinge Pen part . . . . "	7 75
4104—1404	Compass, 5½ inches, fixed Needle Point Leg, with Pencil, Pen and Lengthening Bar . . . . . "	7 50
4105—1405	Same as No. 4104, with Patent Spring-Hinge Pen part . . . . "	8 25
4108—1420	Plain Divider, 5 inches . . . . . "	2 50
4110—1423	Hairspring Divider, 5 inches . . . . . "	4 00

ALTENEDER'S INSTRUMENTS—Continued.

Illustrations full size.

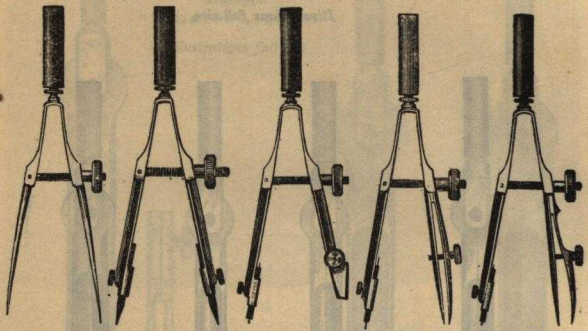


4115 4117 4119 4120

Alteneder's No.		
4115—1474	Compass, 3½ inches, fixed Needle Point Leg, with Pencil, Pen and Lengthening Bar . . . . . each,	$6 75
4116—1475	Same as No. 4115, with Patent Spring-Hinge Pen . . . . . "	7 50
4117—1477	Compass, 3½ inches, with fixed Needle Point Leg and Pen . . . "	4 00
4118—1478	Same as No. 4117, with Patent Spring-Hinge Pen . . . . . "	4 75
4119—1479	Compass, 3½ inches, fixed Needle Point Leg and Pencil . . . . "	4 00
4120—1494	" 3½ " " " " " with Pencil, Pen and Lengthening Bar, Hair Spring Adjustment on Needle Point Leg . . . . . "	8 25
4121—1495	Same as No. 4120, with Patent Spring-Hinge Pen . . . . . "	9 00

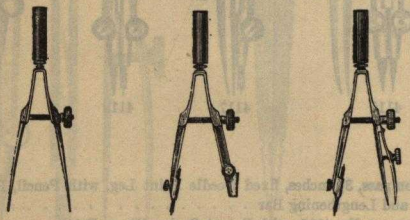
ALTENEDER'S INSTRUMENTS—Continued.

Illustrations full size.



4122 4123 4124 4125 4126

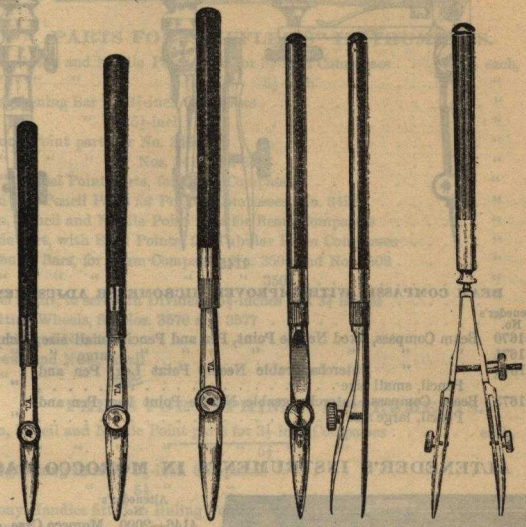
Alteneder's No.		
4122—1530	Bow Spacer, 3 inches, Metal Handle . . . . . each,	$1 75
4123—1531	" " 3 " " " with Needle Points . . . "	2 50
4124—1532	" Pencil, Needle Point, 3 inches, Metal Handle . . . . . "	2 50
4125—1533	" Pen, " " 3 " " " . . . . . "	2 50
4126—1535	" " " " 3 " " " with Spring on Pen . . . . . "	2 65
4127—1537	Imitation Morocco Case for any three of above Instruments . . "	80
4128—1538	Real Morocco-Leather Covered Case, for any three of above Instruments . . . . . "	1 00



4129 4130 4131

Alteneder's No.		
4129—1510	Minute Bow Spacer, 1½ inches . . . . . each,	$1 75
4130—1514	" " Pencil, 1½ " with Needle Point . . . . . "	2 75
4131—1516	" " Pen, 1½ " " " " Spring on Pen, "	2 75
4132—1517	Imitation Morocco Case for the three above Instruments . . . "	80
4133—1518	Real " " " " " " " "	1 00

ALTENEDER'S RULING PENS.

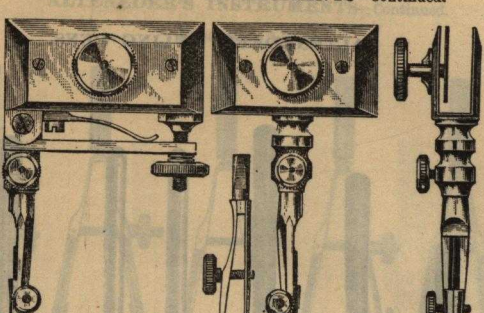


4134 4135 4136 4138 4140

Alteneder's No.		
4134—1610	Ruling Pen, 4½ inches, Ebony Handle.. . . . . each,	$1 25
4135—1611	" " 5 " " " . . . . . "	1 50
4136—1612	" " 5½ " " " . . . . . "	1 75
4137—1613	" " 4½ " with Spring on Upper Blade, Ebony Handle . . . . . "	1 40
4138—1614	Ruling Pen, 5 inches, with Spring on Upper Blade, Ebony Handle . . . . . "	1 65
4139—1615	Ruling Pen, 5½ inches, with Spring on Upper Blade, Ebony Handle . . . . . "	1 90
4140—1623	Railroad Pen, 5 inches, Ebony Handle . . . . . "	3 50
4141—1624	" Pencil, 5 " " " . . . . . "	3 50

Aluminum Handles furnished at same price as Ebony.
Any other Instruments not listed will be furnished to order.

ALTENEDER'S INSTRUMENTS—Continued.



4145

BEAM COMPASSES WITH IMPROVED MICROMETER ADJUSTMENT.

Alteneder's No.		
4142—1670	Beam Compass, fixed Needle Point, Pen and Pencil, small size, each,	$7 00
4143—1671	" " " " " " " large " "	8 00
4144—1672	" " Interchangeable Needle Point Leg, Pen and Pencil, small size . . . . . "	7 75
4145—1673	Beam Compass, Interchangeable Needle Point Leg, Pen and Pencil, large size . . . . . "	8 75

ALTENEDER'S INSTRUMENTS IN MOROCCO CASES.

4147

Alteneder's No.

4146—2000 Morocco Case, containing No. 1477 Dividers, 3½ inches. fixed Needle Point and Pen, No. 1479 Divider, 3½ inches, fixed Needle Point and Pencil, No. 1613 Improved Ruling Pen, 4½ in., Ebony Handle, ea. $10 75

Alteneder's No.

4147—2048 Morocco Case, containing No. 1404 Divider, 5½ inches, fixed Needle Point, with Pen, Pencil and Lengthening Bar, *No. 1532 Spring Bow Pencil, 3 inches, No. 1533 Spring Bow Pen, 3 inches, No. 1614 Improved Ruling Pen, 5 inches, Spring on Upper Blade, Ebony Handle, each, $15 75.

4148—2066 Morocco Case, containing No. 1404 Divider, 5½ inches, fixed Needle Point, with Pen, Pencil and Lengthening Bar, No. 1423 Hairspring Divider, 5 inches, Nos. 1530, 1532 and 1533, Spring Bow Instruments, 3 inches, Nos. 1613 and 1614 Improved Ruling Pens, 4½ and 5 inches . . . . . " 23 50

Any other set of Alteneder's Instruments in Morocco Case furnished to order.
**The No. 1532 is furnished with two Steel Points so that it may be used as a Spacer.*

SEPARATE PARTS
—FOR—
DRAWING INSTRUMENTS.

4150 PARTS FOR "RIEFLER'S" INSTRUMENTS.

Pen, Pencil and Needle Point parts for 3½-inch Compasses	each,	$1 10
" " " " " " 5½-inch "	"	1 25
Lengthening Bar for 3½-inch Compasses	"	75
" " 5½-inch "	"	1 00
Round Point part, for No. 3424	"	75
" " " " Nos. 3412 and 3413	"	65
" Steel Point parts, for Beam Compasses	"	60
Pen and Pencil Parts for Pocket Compasses, No. 3428	"	2 00
Pen, Pencil and Needle Point part for Beam Compasses	"	1 00
Slide part, with Steel Points, for Tubular Beam Compasses	"	3 30
Tubular Bars, for Beam Compasses No. 3500 and No. 3502	"	2 00
" " " " " " 3504	"	3 00
Steel Point, to screw in Dividers, 5½-inches and 3½ inches	"	40
Dotting Wheels, for Nos. 3570 and 3577	"	40
Shouldered Needles	"	20
Screws and Nuts, small	"	10
" " " large	"	15

4151 PARTS FOR "SPHINX" INSTRUMENTS.

Pen, Pencil and Needle Point parts for 3½-inch Compasses	each,	$ 80
" " " " " " 5½ " "	"	1 00
Lengthening Bars for 3½-inch Compasses	"	50
" " " 5½ " "	"	60
Ebony Handles fitted to Ruling Pens (any size)	"	25
Screws and Nuts	"	12
Shouldered Needles	"	15

4152 PARTS FOR "COSMOS" INSTRUMENTS.

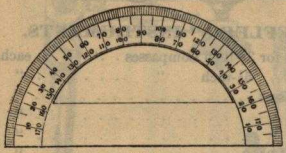
Pen, Pencil and Needle Point parts for 3½-inch Compasses	each,	$ 60
" " " " " " 5½ " "	"	80
Lengthening Bars for 3½-inch Compasses	"	40
" " " 5½ " "	"	50
Ebony Handles fitted to Ruling Pens (any size)	"	25
Screws and Nuts	"	12
Shouldered Needles	"	10

4153 PARTS FOR "ECLIPSE" INSTRUMENTS.

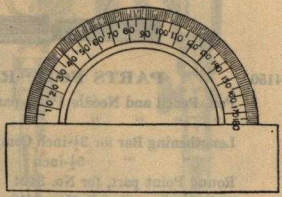
Pen, Pencil and Needle Point parts for 3½-inch Compasses	each,	$ 35
" " " " " " 5½ " "	"	50
Lengthening Bars for 3½-inch Compasses	"	30
" " " 5½ " "	"	35
Ebony Handles fitted to Ruling Pens (any size)	"	25
Screws and Nuts	"	10
Shouldered Needles	"	8

PROTRACTORS.

METAL PRORACTORS.

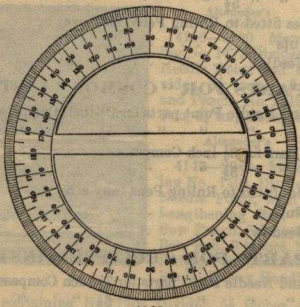


4160



4161

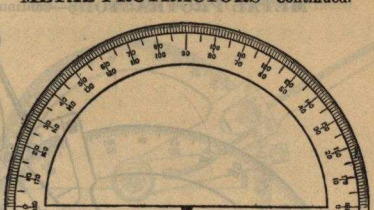
Old No.							Per Doz.	Each.
4160—480	Brass (Nickeled) Half Circles, whole degrees, 3 inches						$ 75	$ 08
4161—481	" (Silvered)	"	"	"	"	2½ "	1 25	12
4162—482	" "	"	"	"	"	3¾ "	like No. 4160, 1 50	15
4163—483	" "	"	"	"	"	3 "	" " 4161, 1 50	15
4170——	" (Fine)	"	"	½	"	4 "		40
4171——	" "	"	"	½	"	5 "		50
4172——	" "	"	"	½	"	6 "		60
4174——	(German Silver)	"	"	½	"	3¾ "		60
4175——	" "	"	"	½	"	4½ "		90
4176——	" "	"	"	½	"	5 "		1 20
4177——	" "	"	"	½	"	6 "		2 00
4178——	" "	"	"	½	"	7 "		2 75
4179——	" "	"	"	¼	"	8 "		3 75



4180

4180	German-Silver Protractor, Circular,	½	degrees,	5	inches		each,	$2 50
4181	" " "	½	"	6	"		"	3 25
4182	" " "	¼	"	7	"		"	4 25
4183	" " "	¼	"	8	"		"	5 50

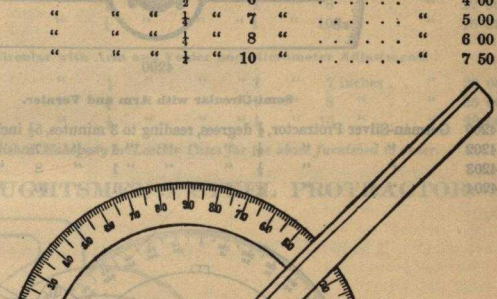
METAL PROTRACTORS—Continued.



4185

Semi-Circular Centre on Inner Edge.

4185	German-Silver Protractor (extra fine),	½	degrees,	5	inches	. . . . .	each,	$3 00
4186	"	"	"	"	½	"	6	"	. . . . .	"	4 00
4187	"	"	"	"	½	"	7	"	. . . . .	"	5 00
4188	"	"	"	"	½	"	8	"	. . . . .	"	6 00
4189	"	"	"	"	½	"	10	"	. . . . .	"	7 50



4190

Semi-Circular with Arm and Horn Centre.

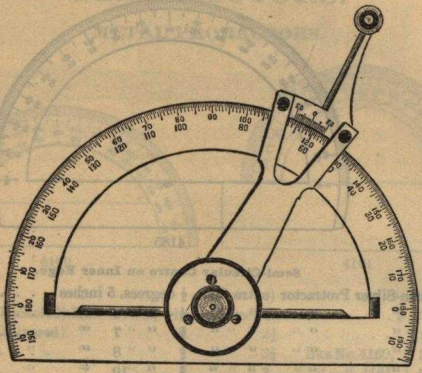
4190	German-Silver Protractor,	½	degrees,	5	inches	. . . . .	each,	$6 50
4191	"	"	½	"	6	"	. . . . .	"	7 50
4192	"	"	½	"	7	"	. . . . .	"	9 00
4193	"	"	½	"	8	"	. . . . .	"	11 00

Circular with Arm and Horn Centre.

4195	German-Silver Protractor,	½	degrees,	5	inches	. . . . .	each,	$10 00
4196	"	"	½	"	6	"	. . . . .	"	12 00
4197	"	"	½	"	7	"	. . . . .	"	14 00
4198	"	"	½	"	8	"	. . . . .	"	16 00

Morocco or Polished Mahogany Case for above furnished to order.

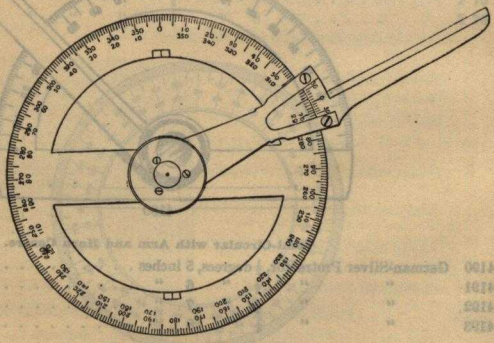
METAL PROTRACTORS—Continued.



4200

Semi-Circular with Arm and Vernier.

4200	German-Silver Protractor,	½	degrees,	reading to	3	minutes,	5½	inches	.	each,	$10 00
4202	"	"	¼	"	"	1	"	7	"	"	12 00
4203	"	"	½	"	"	1	"	8	"	"	14 00
4204	"	"	¼	"	"	1	"	10	"	"	17 00

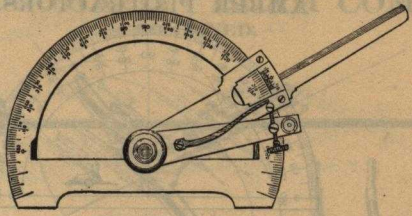


4206

Circular with Arm and Vernier.

4206	German-Silver Protractor,	½	degrees,	reading to	3	minutes,	5½	inches	.	each,	$14 00
4208	"	"	¼	"	"	1	"	8	"	"	16 00
4209	"	"	¼	"	"	1	"	10	"	"	19 00

METAL PROTRACTORS—Continued.



4210

Semi-Circular with Arm and Vernier and Micrometer Adjustment.

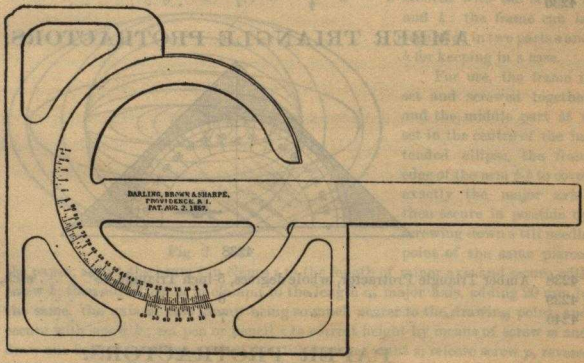
4210	German-Silver Protractor,	½	degrees,	reading to	1	minute,	7	inches	. .	each,	$20	00
4211	"	"	½	"	"	" 1	"	8	"	. .	"	22	00
4212	"	"	½	"	"	" 1	"	10	"	. .	"	25	00

Circular with Arm and Venier and Micrometer Adjustment.

4214	"	"	½	"	"	" 1	"	7	inches	. .	"	23	00
4215	"	"	½	"	"	" 1	"	8	"	. .	"	25	00
4216	"	"	½	"	"	" 1	"	10	"	. .	"	28	00

Polished Mahogany or Leather Cases for the above furnished to order.

DRAUGHTSMEN'S STEEL PROTRACTOR.



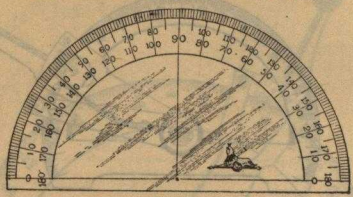
4220

4220 This Protractor is made from sheet steel and is light and durable. The length of the blade is 8½ inches. The graduations read to degrees, and the vernier reads to five minutes . . . . . each, $6 50

4221 Same as No. 4220, in Morocco Case . . . . . " 7 75

PROTRACTORS—Continued.

AMBER PROTRACTORS.



4225

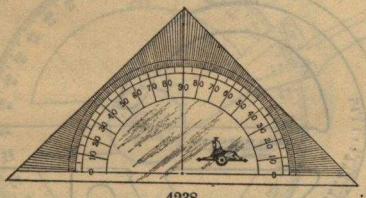
The dividing lines of these Amber Protractors are on the side facing the drawing, and the amber being perfectly transparent they afford a most accurate reading of the degrees.

4225	Amber Protractor, Transparent, Half Circle, ½ degrees, 4 inches . . . each,	$	35
4226	" " " " " ½ " 5 " . . . "		50
4227	" " " " " ½ " 6 " . . . "		75
4228	" " " " " ½ " 7 " . . . "	1	00
4229	" " " " " ½ " 8 " . . . "	1	35
4230	" " " " " ½ " 9 " . . . "	1	75
4231	" " " Circle, ½ " 6 " . . . "	1	75

HORN PROTRACTORS.

4234	Horn Protractor, Half Circle, ½ degrees, 5 inches . . . . . each,	$	25
4235	" " " " ½ " 6 " . . . . . "		30
4236	" " " " ½ " 7 " . . . . . "		40

AMBER TRIANGLE PROTRACTORS.



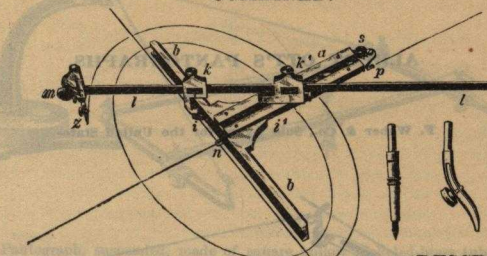
4238

4238	Amber Triangle Protractor, whole degrees, 5-inch Triangle 45° . . . each,	$	60
4239	" " " " " 6 " " " . . . "		75
4240	" " " " " 7 " " " . . . "	1	00

PAPER PROTRACTORS.

4245	Paper Protractor, Circular, 8 inches diameter, in ½ degrees, on paper . . . each,	$	25
4246	" " " 8 " " " ½ " " bristolboard, "		30
4247	" " " 13 " " " ¼ " " paper . . . "		30
4248	" " " 13 " " " ¼ " " bristolboard "		40
4249	" " " 13 " " " 1 " " tracing paper, "		30

RIEFLER'S
ELLIPSOGRAPH AND BEAM COMPASS
COMBINED.



4250

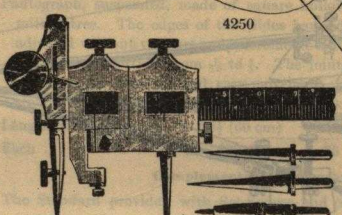


Fig. 1

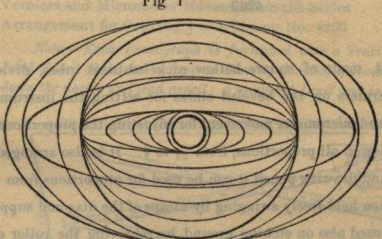


Fig. 2.

DESCRIPTION.

The apparatus consists of two main parts, the frame and the beam compass. The former forms a T with slots in both arms in which the clamps *i* and *ji* slide; these hold the beam *l-l* with pen or pencil *z*: it is divided and can be adjusted in the clamps and secured with the screws *k* and *k*: the frame can be separated in two parts *a* and *b* for keeping in a case.

For use, the frame is set and screwed together and the middle part at *n* set in the centre of the intended ellipse, the front edge of the arm *b-b* to cover exactly the major axis: then secure in position by screwing down *s* till needle point of the same pierces the paper; adjust the beam *l* in clamp *i* to the length of minor axis and secure with screw *k*; then adjust beam in clamp *i* to the length of major axis, adding 20 mm to the same, the axis of this clamp being so much nearer to the drawing point, and secure with screw *k*; set pen or pencil *z* to correct height by means of screw *m* and draw one-half of the ellipse; after this, lift drawing point *z*; release screw *p*, reverse the instrument by swinging it 180 degrees around point *n*, reset screw *p* and drawing point *z*, and draw other half.

The instrument permits to draw all kinds of ellipses and circles, from 10 to 560 mm. major diameter: the pen with bent point to be used for ellipses of less than 22 mm. diameter.

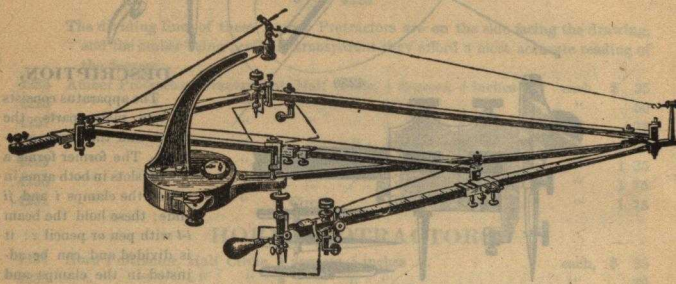
Fig. 1 shows the Beam Compass alone. Fig. 2 shows some examples.

4250 **Ellipsograph and Beam Compass combined, complete, in case . . . . each, $25 00**

PANTOGRAPHS.

ALBERT OTT'S PANTOGRAPHS.

F. Weber & Co., Sole Agent for the United States.



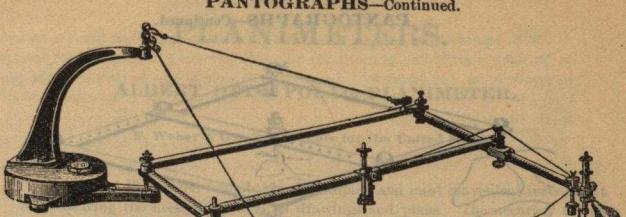
4260

4260 Pantograph, suspended, made of square hollow nickeled-brass tubes, divided in millimetres, with verniers on the beveled slides for setting the instrument to $\frac{1}{10}$ millimetre scale, and micrometer movement for adjusting the proportions. For reducing and enlarging in all proportions, from $\frac{1}{10}$ to $\frac{1}{3}$. It is also arranged, that by exchanging pole and drawing pencil it can be used for proportions from $\frac{1}{3}$ to 1. The instrument is then held freely swinging by means of the diagonal supporting bar and can then be used also on etching ground by removing the roller on the drawing point. The joints run on cone-shaped steel pivots, to assure an accurate and easy movement. The standard is provided with two set-screws and spirit-level to adjust the instrument to a horizontal position. With convenient controlling arrangement. In polished wooden case, with lock and handle.

Length of arms, inches	28 (72 cm)	33 (84 cm)	37½ (96 cm)
Each	$150 00	160 00	170 00

4261 Extra Glass Pointer with Lenses for accurate adjustment, which can only be used with instruments 33 and 37½ inches . . . . . each, $10 00

PANTOGRAPHS—Continued.



4262

4262 Pantograph, suspended, made of square hollow nickeled-brass tubes, divided in millimetres. The edges of the slides beveled to allow of the proportions being adjusted without verniers and micrometer movement. For reducing and enlarging in all proportions from $\frac{1}{10}$ to $\frac{1}{4}$. The joints run on cone-shaped steel pivots, to assure an accurate and easy movement; simple control; no screws on the standard. In polished wooden case, with lock and handle.

Length of arms, inches	23½ (60 cm)	28 (72 cm)	33 (84 cm)	37½ (96 cm)
Each	$70 00	75 00	85 00	92 50

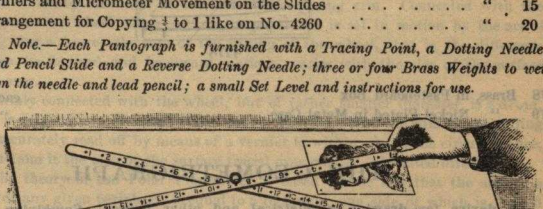
Complements to Pantograph No. 4262.

4263 The Standard provided with Set-Screws and convenient controlling arrangements . . . . . each, $10 00

4264 Verniers and Micrometer Movement on the Slides . . . . . " 15 00

4265 Arrangement for Copying ½ to 1 like on No. 4260 . . . . . " 20 00

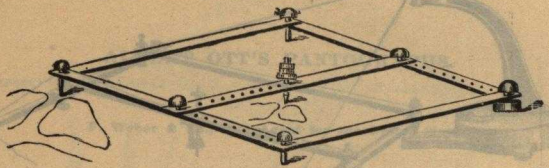
Note.—Each Pantograph is furnished with a Tracing Point, a Dotting Needle, a Lead Pencil Slide and a Reverse Dotting Needle; three or four Brass Weights to weigh down the needle and lead pencil; a small Set Level and instructions for use.



4270

Old No.						
4270—1	Cherry Wood, arms 13 inches				each,	$ 20
4271—1½	Maple Wood,	"	13	"	"	25
4272—4	Ebonized,	"	16	"	"	50
4273—1¾	Maple Wood,	"	17	" Brass Mountings	"	75
4274—2	"	"	17	" " " extra fine	"	1 75

PANTOGRAPHS—Continued.



4275

Old No.

4275—6 Pear Wood, arms 22 inches, Brass Mountings . . . . . each, $4 00

THE POLYGRAPH.

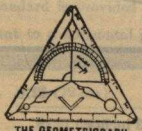
For Drawing Curves of Every Description, Ovals, Oblongs, Circles and an Endless Variety of Designs.

4278

4278 Brass, in Pasteboard Box . . . . . each, $ 25
4279 " Nickel Plated in Metal Case . . . . . " 50

THE GEOMETRIGRAPH.

A device for drawing geometrical and other figures. Combining a Scale, Protractor, Square and Dividers, it exercises the ingenuity of the user in drawing, and is a source of endless amusement for young and old.



THE GEOMETRIGRAPH.

4280

4280 Brass, Nickel Plated . . . . . each, $ 25

PLANIMETERS.

ALBERT OTT'S POLAR PLANIMETER.

F. Weber & Co., Sole Agents for the United States.

The Polar Planimeter is probably the simplest and most convenient instrument for measuring the area of surfaces on drawings and plans. The accuracy of the results which can be attained with this instrument when it is well made and properly used, is so great that it is perfectly satisfactory in all cases. In the cases of surfaces of irregular form and with curved periphery particularly its indications are equaled in accuracy by no other method of mensuration (with compasses and scale). The time saved by using the Polar Planimeter in preference to these other methods is very considerable, especially in the case of such irregular figures. Surfaces with a periphery of perfectly straight lines which can easily be divided into triangles or trapeziums may under certain circumstances be measured with equal ease and accuracy by compasses and scale.

It is of the greatest importance to engineers and others, as plots of ground, sectional areas of vessels, areas of railroad profiles, areas of displacement of floating bodies, indicator diagrams, etc., can be quickly ascertained.

The essential parts of the Polar Planimeter are three: the outer or tracing arm, the inner or polar arm and the wheel. When in use, the polar arm turns round a fixed point, the pole of the instrument, the other end is jointed to the tracing arm, thus allowing any closed line representing a space to be traced over within certain definite limits by the tracer at the end of the tracing arm. Connected with the tracing arm is a wheel which rests on the paper and is set in motion by the act of tracing over a figure; the sum of the rolling of the wheel, that is, the difference between its forward and backward motions, varies with the size of the surface traced over.

Firmly connected with the wheel, but of rather smaller diameter, is a drum, which is marked into divisions of 100 parts, and this allows the sum of the rolling to be accurately read off by means of a vernier to within $\frac{1}{1000}$ of the circumference, so that from it the area of the surface traced over may be calculated direct.

The theory of the Polar Planimeter is based on the fact that the area of a figure of any given periphery, is equal to a rectangle, one side of which is formed by the length of the tracing arm (calculated from the tracer to the axis of the joint of the polar arm) and the other side by the sum of the rolling of the wheel (the difference between its forward and backward motion) as it traces over the periphery of the figure.

The Polar Planimeter has two principal forms, namely:

(*a*) One with a traveling arm of invariable length.

(*b*) One with a traveling arm of variable length.

The former can only be used for measurements to a single scale. The latter can be used for various scales and for various standards of lengths, for instance: meters, yards, Russian and Austrian standards and so on, for the reason that in these instruments the two sides of the rectangle which corresponds with the measured area are also variable. The longer the traveling arm, the smaller the sum of the rolling of the wheel; the shorter the arm, the greater the sum of the rolling.

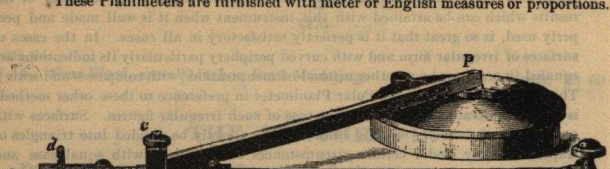
Nos. 4300, 4301, 4302 and 4304 have arms of variable length.

PLANIMETERS – Continued.

With regard to the construction it should further be remarked that the ball-pole on No. 4300 is preferable to the needle-pole, firstly, because the paper is not damaged by needle holes, and secondly, because the pole weight can be shifted on the paper so as to bring the reading of the wheel before beginning the measurement to O or to any required even number.

The divisions and vernier on the traveling arm are in German Silver; the divisions of the wheel with its vernier and those of the counting wheel are on white celluloid.

These Planimeters are furnished with meter or English measures or proportions.



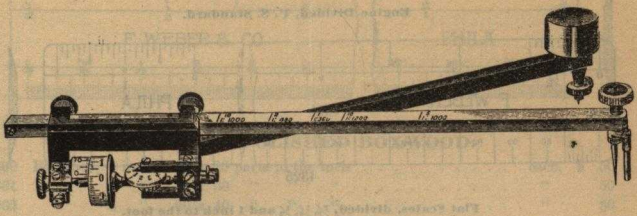
4300

4300 Ott's Polar Planimeter of German Silver. The tracer arm is divided, in ½ millimetres and with proportion marks for any reduction scales to be indicated at will. The slide is movable over the whole length of the tracer arm and has a vernier reading to $\frac{1}{10}$ millimetre. The conveniently accessible set screws, *a* and *b* have the purpose of setting the axis of the roller with the tracer arm parallel to the connection line of the tracing point *f*, with the pivot *c* of the polar arm. With ball-pole and test plate fitted into Morocco case, with lock, in such a manner that the instrument may be laid in, set to any proportion. If so desired, this Planimeter can be furnished, divided into decimals of an inch, or foot, or any other desired scale. These Planimeters are of the best workmanship and guaranteed in every respect . . . . each, $30 00

4301 Ott's Polar Planimeter, the same as No. 4300, with Needle-Pole instead of ball-pole and test rule, in Morocco case, with clasp fastening . . " 27 00

4302 Ott's Planimeter, specially arranged for determining the mean height of steam engine indicator diagrams, with wheel of precisely 66,66 mm. circumference. The height of the diagram is obtained in millimetres and $\frac{1}{5}$ mm without calculation. The instrument may also be used for the ordinary calculation of areas, and for this purpose is provided with divisions and scale marks on the tracing arm. The construction is similar to illustration No. 4300, except that the tracer and the polar axis are prolonged upwards and furnished with pointers for fixing the base line of the diagram. With Ball-Pole and Test Plate, in Morocco case, with Lock and Key, like No. 4300 . . . . " 32 50

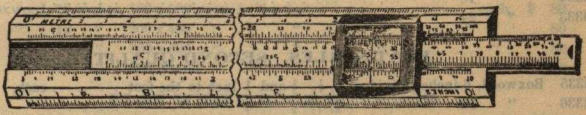
PLANIMETERS—Continued.



4304

4304 Ott's Polar Planimeter of German Silver, of simpler construction, with adjustable Tracing Arm. With Index Marks for adjusting the scale 3 to 4 proportions, similar to Amsler's construction. With Needle-Pole and Test Rule, in Morocco case . . . . . each, $22 50

CALCULATING SCALES OR SLIDE RULES.



4310

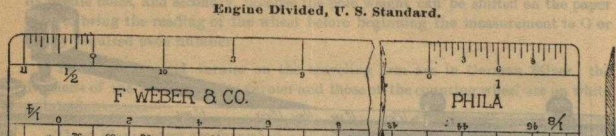
Calculating Scales, or Mathematical Rules, have been in existence for many years, but some important improvements upon those hitherto in use have been made, and those who are experienced in the use of this interesting contrivance will not be long in recognizing its merits. The number of arithmetical and technical problems that can be worked out with its aid is almost endless.

The Rule is made of boxwood and the traversing slide of bronzed metal; the figuring has been done with the utmost care and distinctness so as to insure the greatest accuracy.

4310 Boxwood, 10 inches, with Glass Indicator and directions . . . . . each, $ 3 50
4312 " " Manheim, with Brass Indicator and Directions, " 3 50
4314 Celluloid Facing, 10 inches, Manheim, with Brass Indicator and directions . . . . . " 4 50
4315 Celluloid Facing, 20 inches, Manheim, with Brass Indicator and directions . . . . . " 16 50

FLAT BOXWOOD AND WHITE EDGE SCALES.

Engine Divided, U. S. Standard.



4325

Flat Scales, divided, 1/8, 1/4, 1/2 and 1 inch to the foot.

4325	Boxwood, 6 inches	each,	$ 50
4326	" 12 "	"	75
4327	" 12½ "	"	85
4328	" 18 "	"	1 50
4329	" 24 "	"	2 00

The 12½-inch scale measures 100 feet on ⅛-inch scale, 50 feet on ¼-inch scale, 25 feet on ½-inch scale.

Flat Scales, divided, 3/8, 3/4, 1½ and 3 inches to the foot.

4330	Boxwood, 6 inches	each,	$ 50
4331	" 12 "	"	75
4332	" 18 "	"	1 50
4333	" 24 "	"	2 00

FLAT SCALES. SECOND QUALITY.

4335	Boxwood, 6 inches, divided, ⅛, ¼, ½ and 1 inch to the foot	each,	$ 35
4336	" 12 " " ⅛, ¼, ½ " 1 " " " "	"	50
4337	" 6 " " ⅜, ¾, 1½ " 3 " " "	"	35
4338	" 12 " " ⅜, ¾, 1½ " 3 " " "	"	50

FLAT WHITE EDGE BOXWOOD.

Flat Scales, divided, 1/8, 1/4, 1/2 and 1 inch to the foot.

4345	White Edge, 6 inches	each,	$ 75
4346	" " 12 "	"	1 25
4347	" " 12½ "	"	1 35
4348	" " 18 "	"	2 25
4349	" " 24 "	"	3 00

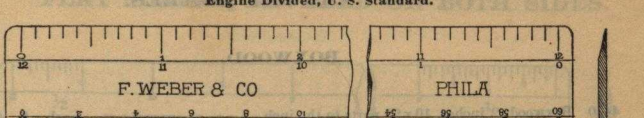
The 12½-inch scale measures 100 feet on ⅛-inch scale, 50 feet on ¼-inch scale, 25 feet on ½-inch scale.

Flat Scales, divided, 3/8, 3/4, 1½ and 3 inches to the foot.

4350	White Edge, 6 inches	each,	$ 75
4351	" " 12 "	"	1 25
4352	" " 18 "	"	2 25
4353	" " 24 "	"	3 00

FLAT SCALES—Continued.

Engine Divided, U. S. Standard.



4360

FLAT POLISHED BOXWOOD.

4360	Boxwood, 6 inches, 10 x 20 parts to the inch	each,	$ 50
4361	" 6 " 10 x 50 " " "	"	50
4362	" 6 " 20 x 40 " " "	"	50
4363	" 6 " 30 x 60 " " "	"	50
4364	" 6 " 40 x 80 " " "	"	75
4365	" 6 " 50 x 100 " " "	"	75
4366	" 6 " 80 x 100 " " "	"	75
4367	Boxwood, 12 inches, 10 x 20 parts to the inch	each,	$ 75
4368	" 12 " 10 x 50 " " "	"	75
4369	" 12 " 20 x 40 " " "	"	75
4370	" 12 " 30 x 60 " " "	"	75
4371	" 12 " 40 x 80 " " "	"	1 20
4372	" 12 " 50 x 100 " " "	"	1 20
4373	" 12 " 80 x 100 " " "	"	1 20
4374	Boxwood, 12 inches, 100 x 500 parts to the foot	each,	$ 80
4375	" 12 " 200 x 400 " " "	"	80
4376	" 12 " 300 x 600 " " "	"	80
4377	" 12 " 800 x 1000 " " "	"	1 20

FLAT WHITE EDGE BOXWOOD.

4380	White Edge, 6 inches, 10 x 20 parts to the inch	each,	$ 75
4381	" " 6 " 10 x 50 " " "	"	75
4382	" " 6 " 20 x 40 " " "	"	75
4383	" " 6 " 30 x 60 " " "	"	75
4384	" " 6 " 40 x 80 " " "	"	1 00
4385	" " 6 " 50 x 100 " " "	"	1 00
4386	" " 6 " 80 x 100 " " "	"	1 00
4387	White Edge, 12 inches, 10 x 20 parts to the inch	each,	$1 25
4388	" " 12 " 10 x 50 " " "	"	1 25
4389	" " 12 " 20 x 40 " " "	"	1 25
4390	" " 12 " 30 x 60 " " "	"	1 25
4391	" " 12 " 40 x 80 " " "	"	1 75
4392	" " 12 " 50 x 100 " " "	"	1 75
4393	" " 12 " 80 x 100 " " "	"	1 75
4394	White Edge, 12 inches, 100 x 500 parts to the foot	each,	$1 25
4395	" " 12 " 200 x 400 " " "	"	1 25
4396	" " 12 " 300 x 600 " " "	"	1 25
4397	" " 12 " 800 x 1000 " " "	"	1 75

FLAT OFFSET SCALES.

BOXWOOD.

4400	Boxwood, 2 inches, 10 x 20 parts to the inch	each, $	40
4401	" 2 " 10 x 50 " " "	"	40
4402	" 2 " 20 x 40 " " "	"	40
4403	" 2 " 30 x 60 " " "	"	40
4404	" 2 " 40 x 80 " " "	"	65
4405	" 2 " 50 x 100 " " "	"	65
4406	" 2 " 80 x 100 " "	"	65

WHITE EDGE.

4410	White Edge, 2 inches, 10 x 20 parts to the inch	each, $	70
4411	" " 2 " 10 x 50 " " "	"	70
4412	" " 2 " 20 x 40 " " "	"	70
4413	" " 2 " 30 x 60 " " "	"	70
4414	" " 2 " 40 x 80 " " "	"	90
4415	" " 2 " 50 x 100 " " "	"	90
4116	" " 2 " 80 x 100 " " "	"	90

FLAT METRIC SCALES.

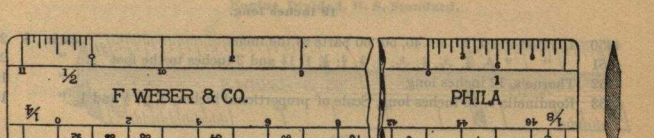
BOXWOOD.

4420	Boxwood, 10 centimetres	each, $	50
4421	" 20 "	"	60
4422	" 30 "	"	75
4423	" 50 "	"	1 50

WHITE EDGE.

4425	White Edge, 10 centimetres	each, $	90
4426	" " 20 "	"	1 10
4427	" " 30 "	"	1 35
4428	" " 50 "	"	2 50

FLAT SCALES, BEVELED ON BOTH SIDES.



4430

FLAT POLISHED BOXWOOD.

Divided, 1/8, 1/4, 1/2, 1, 3/8, 3/4, 1 1/2 and 3 inches to the foot.

4430	Boxwood, 6 inches	each,	$ 80
4431	" 12 "	"	1 20
4432	" 18 "	"	2 25
4433	" 24 "	"	3 00
4434	Rondinella's Scale of proportional inches, 12 inches, 1/8, 1/4, 1/2 and 1	"	80

FLAT SCALES. SECOND QUALITY.

4435	Boxwood, 6 inches, divided, 1/8, 1/4, 1/2, 1, 3/8, 3/4, 1 1/2, 3 inch to the foot	"	50
4436	" 12 " " 1/8, 1/4, 1/2, 1, 3/8, 3/4, 1 1/2, 3 " " "	"	75

FLAT WHITE EDGE.

Divided, 1/8, 1/4, 1/2, 1, 3/8, 3/4, 1 1/2 and 3 inches to the foot.

4437	White Edge, 6 inches	each,	$1 35
4438	" " 12 "	"	2 00
4439	" " 18 "	"	3 50
4440	" " 24 "	"	4 75

FLAT SCALES—FULL DIVIDED.

FLAT POLISHED BOXWOOD.

4441	Boxwood, 12 inches, 1/16 and 1/10 to the inch	each,	$ 75
4442	" 12 " 1/16 " 1/32 " "	"	1 00
4443	" 12 " 1/16 " millimetres	"	1 00

FLAT WHITE EDGE.

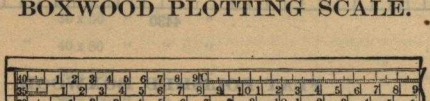
4445	White Edge, 12 inches, 1/16 and 1/10 to the inch	each,	$1 50
4446	" " 12 " 1/16 " 1/32 " "	"	1 50
4447	" " 12 " 1/16 " millimetres	"	1 50

BRISTOL BOARD OR PAPER SCALES.

19 inches long.

4450 Divided in 10, 20, 30, 40, 50, 60 parts to the inch . . . . . each, $ 20
4451 " " $\frac{3}{32}$, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{2}$ and 3 inches to the foot . . " 20
4452 Thorne's, 12 inches long . . . . . " 10
4453 Rondinella's, 12 inches long, Scale of proportional inches, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and 1 " 10

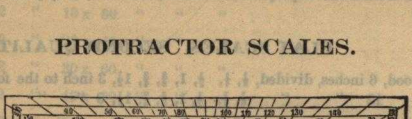
BOXWOOD PLOTTING SCALE.



4460

4460 Plotting Scale, 6 inches long, Boxwood . . . . . each, $ 15

PROTRACTOR SCALES.

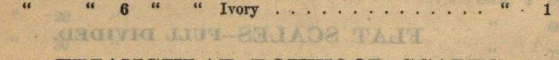


4461

4461 Protractor Scales, 6 inches long, Boxwood . . . . . each, $ 40
4462 " " 6 " " Ivory . . . . . " 1 50

TRIANGULAR BOXWOOD SCALES.

With Handle.

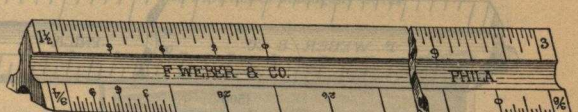


4468

4468 Boxwood, 12 inches, divided $\frac{1}{16}$ x $\frac{1}{16}$ inch . . . . . each, $ 45
4469 " 12 " " $\frac{1}{16}$ x millimetres . . . . . " 45

TRIANGULAR
BOXWOOD AND WHITE EDGE SCALES.

Engine Divided, U. S. Standard.



4470

TRIANGULAR BOXWOOD.

Graduated $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, 1, $1\frac{1}{2}$, 3 inches to the foot, and one edge $\frac{1}{16}$ to the inch.

4470	Boxwood, 6 inches	each,	$ 75
4471	" 12 "	"	1 00
4472	" 18 "	"	2 25
4473	" 24 "	"	4 00

Graduated $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1, $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3, 2, 4 inches to the foot, and one edge $\frac{1}{16}$ to the inch.

4474	Boxwood, 6 inches	each,	$ 75
4475	" 12 "	"	1 00
4476	" 18 "	"	2 25
4477	" 24 "	"	4 00

TRIANGULAR WHITE EDGE.

Graduated $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, 1, $1\frac{1}{2}$, 3 inches to the foot, and one edge $\frac{1}{16}$ to the inch.

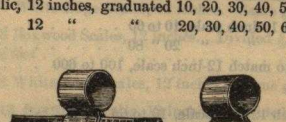
4480	White Edge, 6 inches	each,	$1 50
4481	" " 12 "	"	2 50
4482	" " 18 "	"	4 50
4483	" " 24 "	"	6 50

Graduated $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1, $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3, 2, 4 inches to the foot, and one edge $\frac{1}{16}$ to the inch.

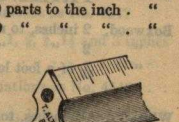
4485	White Edge, 12 inches	each,	$2 50
4486	" " 18 "	"	4 50
4487	" " 24 "	"	6 50

METALLIC TRIANGULAR SCALES.

4490	Metallic, 12 inches, graduated $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, 1, $1\frac{1}{2}$, 3 inches to the foot, and one edge $\frac{1}{16}$ to the inch	each,	$3 00
4491	Metallic, 12 inches, graduated 10, 20, 30, 40, 50, 60 parts to the inch	"	3 00
4492	" 12 " " 20, 30, 40, 50, 60, 80 " " " "	"	3 00



4495

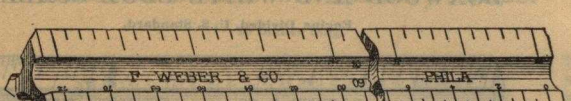


4496

4495	Scale Guard to show the side of scale in use	each,	$ 20
4496	Scale Protectors of German Silver, placed on any Triangular Scale, at an additional cost on each scale of		75

TRIANGULAR SCALES—Continued.

Engine Divided, U. S. Standard.



4500

TRIANGULAR BOXWOOD.

Graduated 10, 20, 30, 40, 50 and 60 parts to the inch.

4500	Boxwood, 6 inches	each,	$ 75
4501	" 12 "	"	1 00
4502	" 18 "	"	2 25
4503	" 24 "	"	4 00

Graduated 20, 30, 40, 50, 60 and 80 parts to the inch.

4505	Boxwood, 6 inches	each,	$ 75
4506	" 12 "	"	1 00
4507	" 18 "	"	2 25
4508	" 24 "	"	4 00
4509	" 12 " graduated 100, 200, 300, 400, 500 and 600 parts to the foot	"	1 50

TRIANGULAR WHITE EDGE.

Graduated 10, 20, 30, 40, 50 and 60 parts to the inch.

4510	White Edge, 6 inches	each,	$1 50
4511	" " 12 "	"	2 50
4512	" " 18 "	"	4 50
4513	" " 24 "	"	6 50

Graduated 20, 30, 40, 50, 60 and 80 parts to the inch.

4514	White Edge, 6 inches	each,	$1 50
4515	" " 12 "	"	2 50
4516	" " 12 " graduated 100, 200, 300, 400, 500 and 600 parts to the foot	"	2 50

TRIANGULAR OFFSET SCALES.

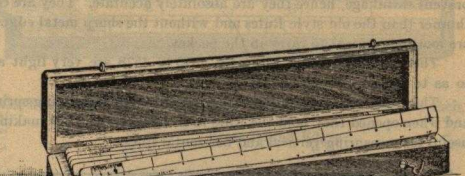
4520	Boxwood, 2 inches, to match 12-inch scale, 10 to 60	each,	$ 60
4521	" 2 " " " " 20 " 80	"	60
4522	" $\frac{2}{10}$ of a foot long, to match 12-inch scale, 100 to 600	"	75
4523	White Edge, 2 inches, to match 12-inch scale, 10 to 60	each,	$1 20
4524	" " 2 " " " " 20 " 80	"	1 20

TRIANGULAR METRIC SCALES.

4530	Boxwood, 20 centimetres, graduated to millimetres and $\frac{1}{2}$ millimetres,	each,	$1 25
4531	" 30 " " " " " " " "	"	1 50
4532	" 50 " " " " " " " "	"	2 75

FLAT SCALES IN SETS.

In Partitioned Mahogany Boxes.



4542

Nos. 4540 to 4545 have a different scale on each edge; both edges are divided and figured to read both ways.

4540 Set of 4 Boxwood Scales, 12 inches. Divided $\frac{1}{8}$ and $\frac{1}{4}$, $\frac{1}{2}$ and 1, $\frac{3}{8}$ and $\frac{3}{4}$, $1\frac{1}{2}$ and 3 inches to the foot . . . . . $ 4 25

4541 Set of 4 White-Edge Scales, 12 inches. Same graduations as No. 4540 . . . 6 25

4542 Set of 6 Boxwood Scales, 12 inches. Divided $\frac{1}{8}$ and $\frac{1}{4}$, $\frac{1}{2}$ and 1, $\frac{3}{8}$ and $\frac{3}{4}$, $1\frac{1}{2}$ 3, 2 and 4, 6 and 12 inches to the foot 6 00

4543 Set of 6 White-Edge Scales, 12 inches. Same graduations as No. 4542 . . 9 00

4544 Set of 6 Boxwood Scales, 12 inches. Divided $\frac{1}{8}$ and $\frac{1}{4}$, $\frac{1}{2}$ and 1, $\frac{3}{8}$ and $\frac{3}{4}$, $1\frac{1}{2}$ and 3, $\frac{3}{32}$ and $\frac{3}{16}$, 6 and 12 inches to the foot 6 00

4545 Set of 6 White-Edge Scales, 12 inches. Same graduations as No. 4544 . . . 9 00

Nos. 4546 to 4553 have the same scale on both edges; one edge is divided and figured to read from left to right, and the other from right to left.

4546 Set of 4 Boxwood Scales, 12 inches. Divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and 1 inch to the foot, $ 4 25

4547 Set of 4 White-Edge Scales, 12 inches. Same graduations as No. 4547 . . 6 25

4548 Set of 8 Boxwood Scales, 12 inches. Divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1, $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$ and 3 inches to the foot 7 50

4549 Set of 8 White-Edge Scales, 12 inches. Same graduations as No. 4548 . . 11 50

4550 Set of 12 Boxwood Scales, 12 inches. Divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1, $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3, 2, 4, 6 and 12 inches to the foot 11 00

4551 Set of 12 White-Edge Scales, 12 inches. Same graduations as No. 4550 . . 17 00

4552 Set of 12 Boxwood Scales, 12 inches. Divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1, $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3, $\frac{3}{16}$, $\frac{3}{32}$, 6 and 12 inches to the foot 11 00

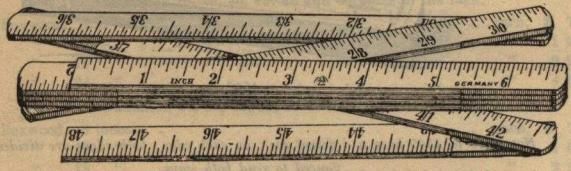
4553 Set of 12 White-Edge Scales, 12 inches. Same graduations as No. 4552 . . 17 00

ENGINEERS' AND CONTRACTORS' POCKET RULES.

These Rules are made of a flexible and light wood, prepared in a manner to prevent shrinkage, hence they are absolutely accurate. They are constructed much thinner than the old style Rules and without the sharp metal edges, therefore they are more convenient to carry in the pocket.

The "extra flexible" Rules No. 4575 to 4578 are very light and can be bent so as to measure round objects.

The Rules No. 4580 to 4586 are provided with self-closing springs in the joints, and when opened they hold the Rule in a straight line, thus making them specially useful for measuring vertical and horizontal lines



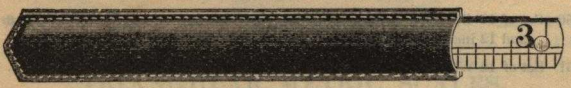
4580

All Rules are divided on both sides, and read from right and left.

Old No.										Each.	Per Doz
4570—100	2 feet,	flexible,	4	folds,	divided	$\frac{1}{16}$	and	inches	. . . . .	$ 15	$ 1 40
4571—100	3 "	"	6	"	"	$\frac{1}{16}$	"	"	. . . . .	20	2 00
4572—100	4 "	"	8	"	"	$\frac{1}{16}$	"	"	. . . . .	25	3 00
4573—100	4 "	"	8	"	"	$\frac{1}{16}$,	inches	and metres	. . .	25	3 00
4575—110	2 feet,	extra flexible,	4	folds,	divided	$\frac{1}{16}$	and	inches	. . . .	20	1 85
4576—110	3 "	"	"	6	"	"	$\frac{1}{16}$	"	"	. . . .	30	2 75
4577—110	4 "	"	"	8	"	"	$\frac{1}{16}$	"	"	. . . .	40	3 70
4578—110	4 "	"	"	8	"	"	$\frac{1}{16}$,	inches	and metres	.	40	3 70
4580—120	2 feet,	with springs,	4	folds,	divided	$\frac{1}{16}$	and	inches	. . . .	25	2 75
4581—120	3 "	"	"	6	"	"	$\frac{1}{16}$	"	"	. . . .	35	4 20
4582—120	4 "	"	"	8	"	"	$\frac{1}{16}$	"	"	. . . .	50	5 50
4583—120	5 "	"	"	10	"	"	$\frac{1}{16}$	"	"	. . . .	60	6 90
4584—120	6 "	"	"	12	"	"	$\frac{1}{16}$	"	"	. . . .	75	8 25
4585—120	8 "	"	"	16	"	"	$\frac{1}{16}$	"	"	. . . .	1 00	11 00
4586—120	4 "	"	"	8	"	"	$\frac{1}{16}$,	inches	and metres	.	50	5 50

FOLDING STEEL POCKET RULES.

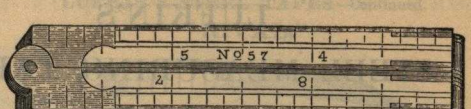
INCLUDING LEATHER CASE.



4595

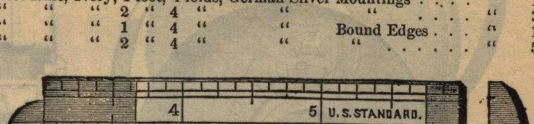
4595	Steel,	1	foot,	$\frac{3}{8}$	inch	wide,	28	guage,	4-inch	joints,	3	folds	. . . . .	each,	$	25
4596	"	2	"	"	"	"	28	"	4	"	"	6	"	. . . . .	"	75
4597	"	2	"	"	"	"	26	"	6	"	"	4	"	. . . . .	"	75

POCKET RULES—Continued.



4602

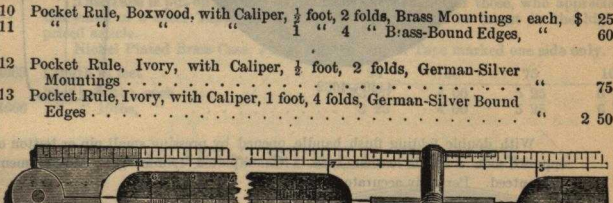
4600 Pocket Rule, Boxwood, 1 foot, 4 folds, Brass Mountings . . . . . each, $ 10
4601 " " " 2 " 4 " " " " . . . . . " 25
4602 " " " 1 " 4 " Brass-Bound Edges . . . . . " 30
4603 " " " 2 " 4 " " " . . . . . " 50
4604 Pocket Rule, Ivory, 1 foot, 4 folds, German-Silver Mountings . . . . " 1 00
4605 " " " 2 " 4 " " " . . . . " 3 75
4606 " " " 1 " 4 " " Bound Edges . . . " 1 75
4607 " " " 2 " 4 " " " . . . . . " 5 00



4611

4610 Pocket Rule, Boxwood, with Caliper, ½ foot, 2 folds, Brass Mountings . each, $ 25
4611 " " " " 1 " 4 " Brass-Bound Edges, " 60

4612 Pocket Rule, Ivory, with Caliper, ½ foot, 2 folds, German-Silver Mountings . . . . . " 75
4613 Pocket Rule, Ivory, with Caliper, 1 foot, 4 folds, German-Silver Bound Edges . . . . . " 2 50



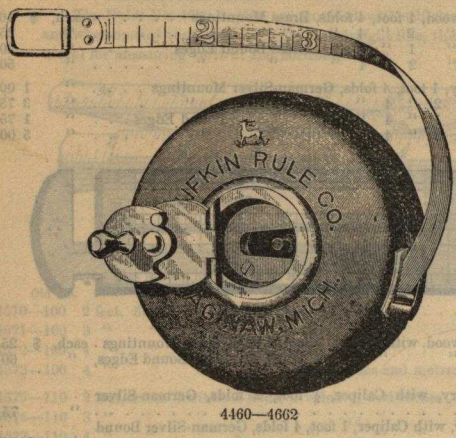
4614

1614 Architects' Scale Rule, with Beveled Edges, Boxwood, 2 feet, 4 folds, Brass Mountings, with Scales on Beveled Edge . . . . . each, $ 75
1615 Architects' Scale Rule, with Beveled Edges, Ivory, German-Silver Mounted, 2 feet, 4 folds, with Scales on Beveled Edges . . . . . " 6 00

FLAT SCHOOL RULES.

4620 12 inches, flat, for school use, divided ⅛ and 1 inch, and metres . . each, $ 05
4621 12 " " " " " 1/16 " 1 " " " polished, " 08
4622 12 " divided in ½ to 1 inch, with Brass Edge . . . . . " 12
4623 15 " " " ½ to 1 " " " " . . . . . " 15
4624 18 " " " ½ to 1 " " " " . . . . . " 20
4625 24 " " " ½ to 1 " " " " . . . . . " 30

LUFKIN'S
STEEL MEASURING TAPES.
"RELIABLE."



4460—4662

With double folding flush handle, opened by pressing small pin or button on opposite side. Hard leather case. Nickel-plated trimmings. Measurements guaranteed. Perfectly accurate

TAPES ⅜ INCH WIDE.

Marked feet in 12ths and links.

4660	Length in feet	25	33	50	66	75	100
	Each	$4 50	5 20	7 20	9 20	10 40	12 80

Marked feet in 10ths and links.

4661	Length in feet	25	33	50	66	75	100
	Each	$4 50	5 20	7 20	9 20	10 40	12 80

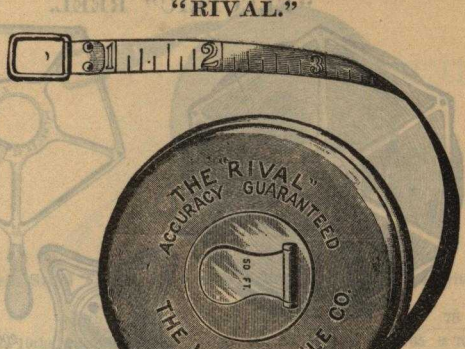
TAPES, NICKEL PLATED.

4662	Length in feet	25	33	50	66	75	100
	In addition to above, each	$1 00	1 00	1 50	1 75	1 75	2 00

The above Tapes are furnished divided in metres at the same price of the corresponding length in feet.

LUFKIN'S STEEL TAPES—Continued.

"RIVAL."



4665 and 4666

This Tape is put on the market to meet the demand of those, who appreciate the value of a Steel Tape and who do not feel inclined to invest in the higher priced article.

Nickel Plated Brass Case, Flush Handle, $\frac{3}{8}$ inch Tape marked one side only.

	Length in feet	25	50	75	100
4665	Feet in 12ths, each	$3 25	4 00	5 25	6 75
4666	" " 10ths, "	3 25	4 00	5 25	6 75

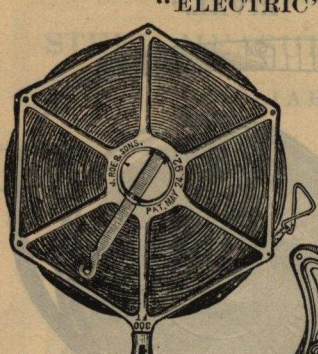
ROE'S STEEL TAPES.

4670

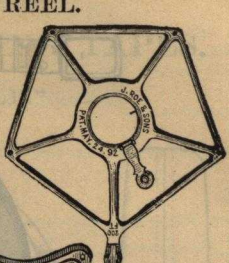
Roe's Steel Tapes, $\frac{1}{2}$ inch wide, in Japanned Metal Case with Folding Handle. This Tape can always be easily detached from case and an extra handle is always furnished for the inside end.

	Length in feet	25	33	50	66	75	100
4670	Feet divided in 10ths, each	$3 25	4 00	5 00	7 00	7 90	10 25
4671	" " " 12ths, "	3 25	4 00	5 00	7 00	7 90	10 25
4672	" " " 10ths, with links, each	3 65	4 50	5 75	8 00	9 10	11 75
4673	" " " 12ths, " " "	3 65	4 50	5 75	8 00	9 10	11 75

ROE'S STEEL TAPE CHAINS ON PATENT "ELECTRIC" REEL.



300-foot style.



200-foot style.

50 and 100-foot style.

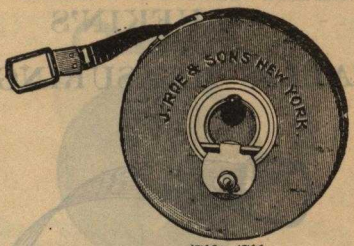
These Tapes are made of superior steel, made to order especially for us; are about ¼ inch in width; are graduated every foot or link by brass rivets, and each end foot in tenths or inches. Contrary to the usual supposition, the Tape is stronger and less liable to break at the rivets than anywhere else.

Every five feet or links, has a *brass* clasp with numbers, and every ten feet or links, has a *copper* clasp with numbers indelibly stamped on both sides. The figures are put on for those unaccustomed to the Tape. After using a few times, the measures at any point can be read by the signs made by rivets.

			Plain.	Nickel Plated.	Aluminum Plated.
4675	50 feet long, every foot. End feet in	tenths	$4 00	$5 00	$5 50
4676	50 " " " " " "	inches	4 00	5 00	5 50
4679	100 " " " " " "	tenths	5 00	6 00	7 00
4680	100 " " " " " "	inches	5 00	6 00	7 00
4681	100 " " 5 feet. " " "	tenths	4 00	5 00	6 00
4682	100 " " " " " "	inches	4 00	5 00	6 00
4683	200 " " foot. " " "	tenths	7 50	9 00	10 50
4684	200 " " " " " "	inches	7 50	9 00	10 50
4685	200 " " 5 feet. " " "	tenths	6 00	7 50	9 00
4686	200 " " 5 " " " "	inches	6 00	7 50	9 00
4687	300 " " foot. " " "	tenths	10 00	12 00	14 00
4688	300 " " 5 feet. " " "	"	8 00	10 00	12 00
4689	300 " " foot. " " "	inches	10 00	12 00	14 00
4690	300 " " 5 feet. " " "	"	8 00	10 00	12 00
4700	Electric Reel, without Tape for 100 feet				1 50
4701	" " " " " 200 "				2 00
4702	" " " " " 300 "				2 50
4703	Brass Detachable Handles, per pair				30

The above Tapes are furnished also in vara measure at the same prices as above.

ROE'S STEEL TAPES—Continued.

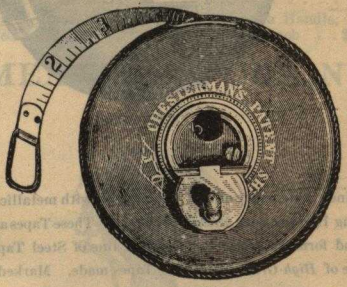


4710—4711

Roe's Steel Tapes, ⅜ inch wide, in Red Bent Leather Case, with Flush Handle.

Roe's No.	Length in feet	25	33	50	66	75	100
4710	Divided in 10ths, with links, each, ...	$4 25	5 00	6 85	8 65	9 70	12 20
4711	" " 12ths, " " "	4 25	5 00	6 85	8 65	9 70	12 20

CHESTERMAN'S TAPES.



4724

Divided in 10ths and links, or 12ths and links, in Leather Cases.

Please specify in ordering, whether 10ths or 12ths is desired.

	Length in feet	25	33	50	66	75	100
4720	All Linen, ⅜ inch wide, each . .	$1 40	1 60	2 10	2 40	2 60	3 20
4722	Metallic, ⅜ " " " . .	1 80	2 10	2 60	3 00	3 30	4 20
4724	Steel, ⅜ " " " . .	4 50	5 20	7 20	9 20	10 40	12 80

Metallic Tapes only, without Case.

	Length in feet	50	66	75	100
4726	Each	$1 50	1 80	2 20	2 90

LUFKIN'S
METALLIC MEASURING TAPES.

4727—4728

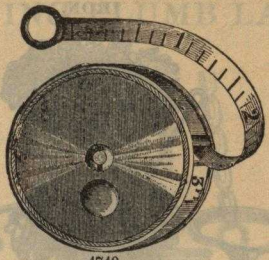
Tape ⅝ inch wide, made of best woven linen with metallic warp. Hard Leather Cases, Folding Handles with Brass Trimmings. These Tapes are guaranteed strictly first class, and form, in connection with our line of Steel Tapes, the best and most complete line of *High-Grade* Measuring Tapes made. Marked both sides.

	Length in feet	25	33	50	66	75	100
4727	Divided in 10ths and links, each,	$1 80	2 10	2 60	3 00	3 30	4 20
4728	" 12ths " " . "	1 80	2 10	2 60	3 00	3 30	4 20

Tapes only, without Case.

	Length in feet . . .	25	33	50	66	75	100
4729	Divided in 10ths and links, each,	$ 90	1 10	1 50	1 80	2 00	2 90
4730	" " 12ths " " "	90	1 10	1 50	1 80	2 00	2 90

HANDY POCKET TAPES.



4740

	Length in feet	1½	3	5	6
4740	Steel Tape, ¼ inch wide, German-Silver Case, with Spring and Stop, divided in $\frac{1}{16}$ inches and metres, each	—	$1 00	1 35	1 50
4742	Steel Tape, $\frac{3}{32}$ inch wide, German-Silver Case, with Spring and Stop and Hook to wear on watch chain, divided in $\frac{1}{16}$ inches and metres, each	65	1 00	—	—
4744	Linen Tape, $\frac{5}{16}$ inches wide, Nickel Case, with Spring and Stop, divided in ⅛ inches and metres	—	35	50	60

	Length in feet	25	50
4745	Steel Tape, $\frac{5}{16}$ inches wide, German-Silver Case, with Handle, one side divided in ⅛ inches and the other in metres, each	$3 75	5 50

MEASURING CHAINS.

STEEL.

4762

4760	Steel, W. G. 12, With Brass Handles, Oval Rings, 50 feet . . . . . each,	$4 50
4762	" " 12, " " " " " " 100 " . . . . . "	8 00

BRAZED LINKS AND RINGS.

4765	Steel, W. G. 12, with Brass Handles, Oval Rings, 50 feet . . . . . each,	$6 00
4766	" " 12. " " " " " " 100 feet . . . . . "	11 00

MEASURING CHAINS—Continued.

IRON.

4770

4770 Iron, W. G. 8, with Brass Handles, Oval Rings, 50 feet . . . . . each, $3 50
4771 " " 8, " " " " " 100 feet . . . . . " 5 50

Meter and Vara-Chains Furnished to Order.

ARROWS OR MARKING PINS.

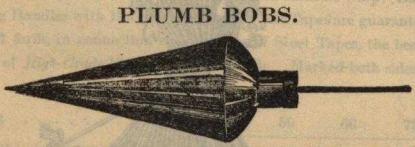
4775

4775 Steel, W. G. 12, Bright, 15 inches, 11 in Set . . . . . each, $1 00
4776 " " 12, Japanned, 15 inches, 11 in Set . . . . . " 1 60

STAKE TACKS.

4785 Stake Tacks, Galvanized, in 2-oz. Boxes . . . . . per box, $ 15

PLUMB BOBS.



4800

4800 Plumb Bobs, Brass, with Screw Cap and Steel Point, Long Neck :

Ounces	6	8	12	16	20	24
Each	$1 25	1 50	2 00	2 50	3 00	3 50

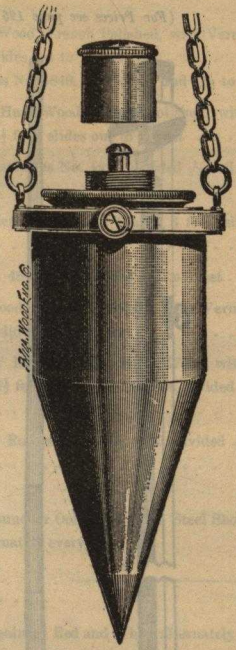
4810 Plumb Bobs, Iron, Drilled Cap, Japanned :

Ounces	10	14	32	44
Each	$ 10	15	40	50

PLUMB BOB LINE.

4815 Plumb Bob Line, Braided Linen . . . . . per 25 yards, $ 50
4816 " " " " Silk . . . . . " 25 " 70

MINING PLUMB LAMP.



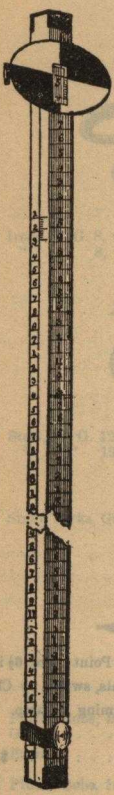
4825

Mining Plumb Lamp is made of Bronze metal with Steel Point; size, 6½ inches long, 2 inches diameter, mounted in universal adjustable joints, swung by Chains. It is made hollow to hold oil, and provided with Burner, forming a Lamp. Take sight from flame. Packed in Mahogany Box, with Strap.

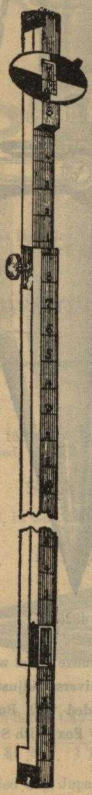
4825	Mining Plumb Lamp, 1 in box	$13 00
4826	" " " 2 "	25 00
4827	Leather Case, with Shoulder Straps, to hold 1 Lamp	3 50

LEVELING RODS AND POLES.

(*For Prices see page 125*)



4840



4842

4860

4862

4865

LEVELING RODS AND POLES—Continued

For Illustrations, see page 124.

4840 Philadelphia Rod, Hard Wood, French Polished, with Vernier, Clamp and Target, 7 feet, slides out to 12 feet . . . . . each, $16 00

4841 Philadelphia Rod, same as No. 4840, divided $\frac{1}{10}$ and $\frac{1}{100}$ to the foot . " 17 00

4842 Light Philadelphia Rod, Hard Wood, French Polished, with Vernier, Clamp and Target, 6½ feet, slides out to 12 feet . . . . . " 14 00

4843 Light Philadelphia Rod, same as No. 4842, divided $\frac{1}{10}$ and $\frac{1}{100}$ to the foot . . . . . " 15 00

4845 Mining Rod, with Vernier, Target and Clamp, 3 feet, slides out to 5 feet . . . . . " 13 50

4846 Mining Rod, same as No. 4845, 5 feet, slides out to 9 feet . . . . . " 14 00

4848 New York Rod, Hard Wood, French Polished, with Vernier, Clamp and Target, 6½ feet, slides out to 12 feet 14 00

4850 Architects' and Builders' Leveling Rod, Hard Wood, with Vernier, Target and Clamp, 5½ feet, slides out 10½ feet, divided inches and ⅛ inches . . . . . " 6 00

4851 Architects' and Builders' Rod, same as No. 4850, divided $\frac{1}{10}$ and $\frac{1}{100}$ to the foot . . . . . " 6 00

4860 Sight Poles of Wood, Round or Octagonal, with Steel Shoes, painted Red and White alternately every foot.

Feet	6	8	10
Each	$2 00	2 25	2 50

4862 Leveling Poles of Wood, painted Red and White alternately, every foot.

Feet	5	6	8	10
Each	$2 50	2 75	3 30	4 40

4865 Tunnel Rod of Wood painted Red and White alternately every foot. 8 feet long . . . . . each, $15 00

The Tunnel Rod is used where accurate sighting is required. Was used by Thos. S. McNair, (M. E.) in the construction of the Jeddo Water Tunnel.

STRAIGHT EDGES.

4970

4970 Cherry Wood, one edge beveled.

Inches	15	18	21	24	30	36	42	48	54	60	72
Each	$ 15	20	25	30	35	40	45	60	75	1 00	1 50

4972

4972 Mahogany, Ebony Lined, one edge beveled.

Inches	18	24	30	36	42	48	54	60
Each	$ 35	55	65	75	1 00	1 25	1 50	1 75

4974

4974 Hard Rubber, Square Edges.

Inches	9	12	15	18	24	30	36	42
Each	$ 30	35	40	70	1 10	1 35	1 80	2 10

4976

4976 Steel, one edge beveled.

Inches	15	18	24	30	36	42	48	60	72
Widths	1⅜	1⅜	1½	1½	1¾	1¾	2	2	2½
Each	$1 80	1 80	2 40	3 30	4 00	4 80	6 00	7 50	10 80
4976N Nickel Plated,	2 00	2 00	2 75	3 75	4 75	5 75	7 00	8 75	12 75

ENGRAVERS' STEEL STRAIGHT EDGES.

4979

4979 Nickel Plated, with Knob, one edge beveled.

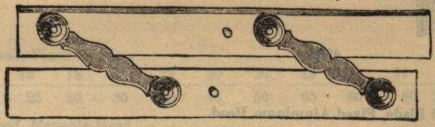
Inches	7	8	10	12	14
Each	$1 00	1 40	1 75	2 00	2 50

FOLDING PARALLEL RULES.

4982

4982 Parallel Rule. Ebony, with Brass Mountings.

Inches	6	9	12	15	18	21	24
Each	$ 25	50	60	85	1 00	1 25	1 60

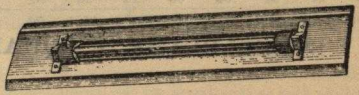


4984

4984 Parallel Rule. Celluloid, with Brass Mountings.

Inches	12	15	18
Each	$1 60	2 00	2 50

ROLLING PARALLEL RULES.



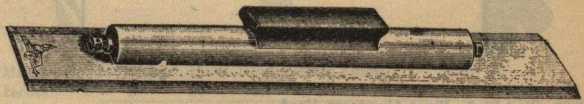
4986

4986 Ebony, Brass Nickel-Plated Mountings.

Inches	9	12	15	18
Each	$2 75	3 25	4 00	5 00

4987 Hard Rubber, Brass Nickel-Plated Mountings.

Inches	9	12	15	18
Each	$3 50	4 25	5 00	6 00



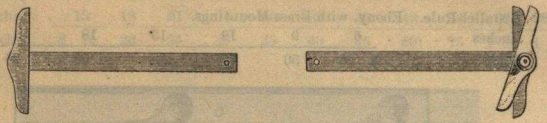
4990

4990 German-Silver, with Ebony-Handle, Beveled Edges.

Inches	9	12	15	18	24
Each	$8 50	10 00	12 00	15 00	20 00

T SQUARES.

ENGRAVERS' METAL T SQUARES.



4995

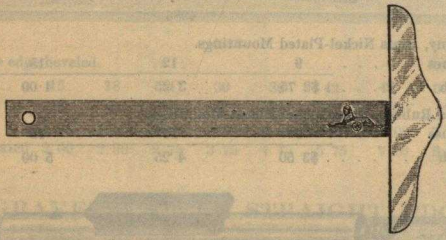
4995 Steel Blade, Fixed Aluminum Head.

Inches	8	10	12	15
Each	$2 50	3 50	4 00	5 00

4996 Steel Blade, Movable Aluminum Head.

Inches	8	10	12	15
Each	$7 50	8 25	9 00	10 00

STEEL BLADE T SQUARES.



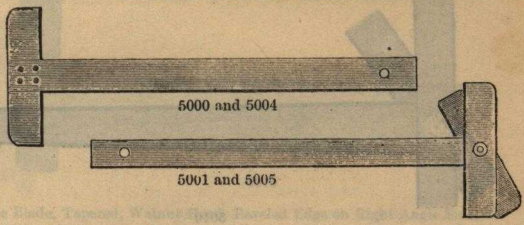
4997

4997 Steel Blade, Fixed Aluminum Head.

Inches	20	24	36
Widths inches	1	1	1¼
Each	$5 00	6 00	7 00

T SQUARES—Continued.

MADE OF BEST SEASONED WOOD.



5000 and 5004

5001 and 5005

5000 Cherry Wood, Fixed Head.

Inches	15	18	21	24	30	36	42	48	54	60	72
Each	$ 25	30	35	40	45	50	65	80	1 00	1 25	1 50

5001 Cherry Wood, Movable Head.

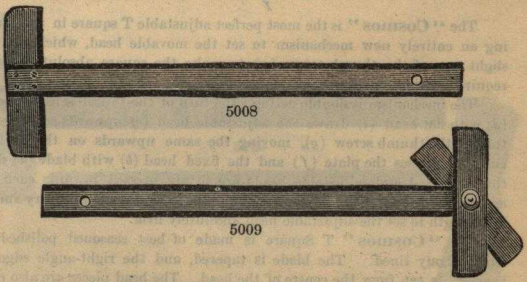
Inches	15	18	21	24	30	36	42	48	54	60	72
Each	$ 60	70	75	85	1 00	1 10	1 25	1 50	1 75	2 00	2 75

5004 Maple Blade and Walnut Head, Fixed.

Inches	15	18	21	24	30	36	42	48	54	60	72
Each	$ 35	40	45	55	65	75	85	1 00	1 25	1 60	2 00

5005 Maple Blade and Walnut Movable Head.

Inches	15	18	21	24	30	36	42	48	54	60	72
Each	$ 85	90	1 00	1 10	1 20	1 35	1 50	1 75	2 00	2 35	2 75



5008

5009

5008 Mahogany, Ebony Lined, Fixed Head, Shellac Finish.

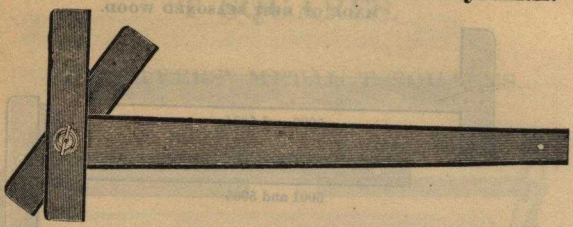
Inches	18	24	30	36	42	48	54	60
Each	$ 75	85	1 00	1 20	1 40	1 60	1 85	2 25

5009 Mahogany, Ebony Lined, Movable Head, Shellac Finish.

Inches	24	30	36	42	48	54	60
Each	1 25	1 50	1 75	2 00	2 25	2 60	3 00

T SQUARES—Continued.

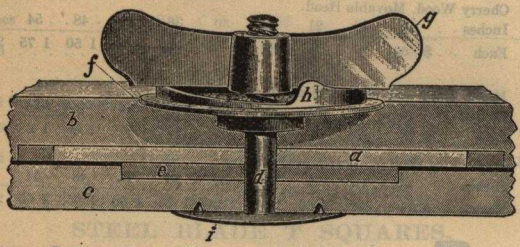
"COSMOS" PATENT SWIVEL T SQUARE.



5010

5010 Mahogany, Ebony Lined, Tapered Blade, polished.

Length, inches	24	30	36	42	48	54	60
Each	$2 00	2 25	2 50	3 00	3 50	4 00	4 50



The **"Cosmos"** is the most perfect adjustable T square in the market, having an entirely new mechanism to set the movable head, which requires only a slight turn of the thumb screw (*g*) to make the square absolutely firm at any required angle.

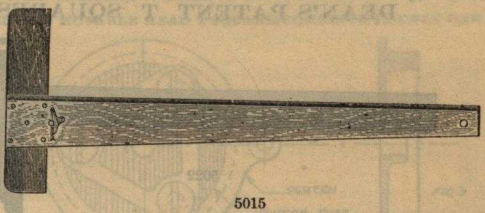
The mechanism is double acting; the turn of the thumb screw (*g*) on the bolt (*d*) with flat head (*i*) draws the adjustable head (*c*) upwards; whilst the same turn of the thumb screw (*g*), moving the same upwards on the incline of the ring (*h*), presses the plate (*f*) and the fixed head (*b*) with blade (*a*) downward; thus the fixed and adjustable heads are firmly pressed towards each other and against the friction plate (*e*); this shows that it requires only a very small amount of strength to set the adjustable head absolutely firm.

The **"Cosmos"** T Square is made of best seasoned polished-mahogany wood, ebony lined. The blade is tapered, and the right-angle edge, which is beveled, is set from the centre of the head. The head pieces are also ebony lined on both sides, which is an advantage when the eccentrically attached adjustable head is reversed; in which case the square can be used close to the edge of the drawing-board.

Unlike all other adjustable T squares the thumb screw of the **"Cosmos"** is on top when the square is required at an angle, thus allowing the draughtsman to set it with greater ease and accuracy.

5011 **"Cosmos"** Swivel, separate . . . . . each, $ 75

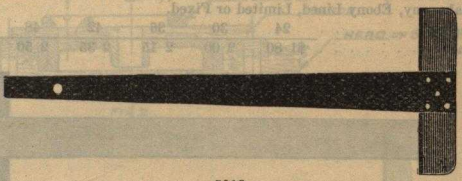
T SQUARES—Continued.



5015

5015 Maple Blade, Tapered, Walnut Head, Beveled Edge on Right-Angle Side.

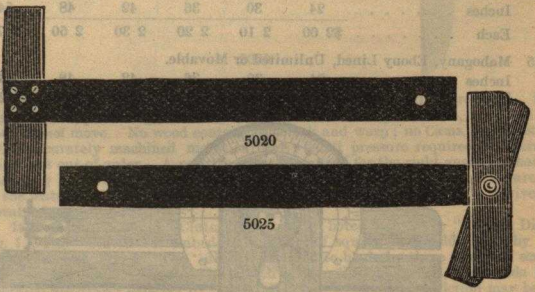
Inches	24	30	36	42	48
Each	$ 65	80	1 00	1 20	1 50



5018

5018 Hard Rubber Tapered Blade, Walnut Head.

Inches	24	30	36	42	48
Each	$1 80	2 40	3 00	3 60	4 20



5020

5025

5020 Hard-Rubber Blade, Walnut Fixed Head.

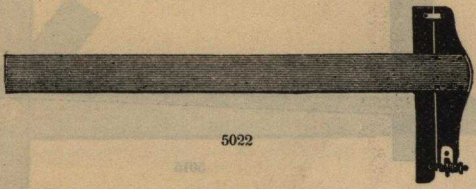
Inches	6	9	12	15	18	21	24	30	36	42	48	54
Each	$ 40	50	60	75	90	1 10	1 35	1 75	2 00	2 75	3 50	4 25

5025 Hard-Rubber Blade, Walnut Movable Head.

Inches	9	12	15	18	21	24	30	36	42	48	54
Each	$1 00	1 10	1 25	1 50	1 75	2 00	2 50	3 00	3 50	4 00	4 50

T SQUARES—Continued.

DEAN'S PATENT T SQUARES.



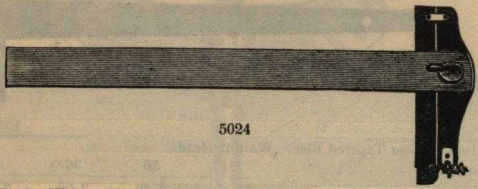
5022

5022 Maple Blade, Walnut Head, Limited or Fixed.

Inches	24	30	36	42	48	54	60
Each	$1 50	1 60	1 70	1 80	2 00	2 25	2 50

5023 Mahogany, Ebony Lined, Limited or Fixed.

Inches	24	30	36	42	48	54	60
Each	$1 80	2 00	2 15	2 35	2 50	2 75	3 25



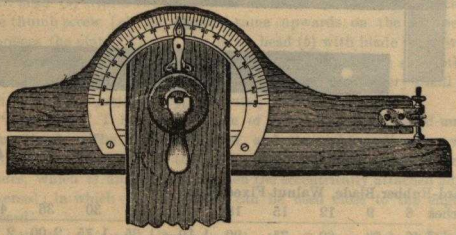
5024

5024 Maple Blade, Walnut Head, Unlimited or Movable.

Inches	24	30	36	42	48	54	60
Each	$2 00	2 10	2 20	2 30	2 50	2 75	3 00

5025 Mahogany, Ebony Lined, Unlimited or Movable.

Inches	24	30	36	42	48	54	60
Each	$2 30	2 50	2 65	2 85	3 00	3 25	3 75



5026

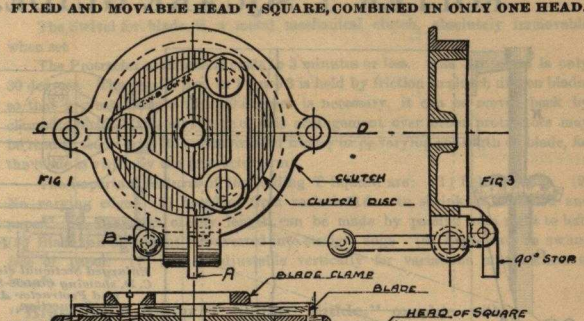
5026 Protractor T Square, Mahogany, Ebony Lined.

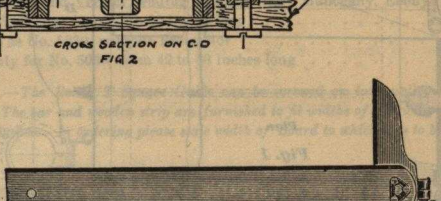
Inches	30	36	42
Each	$5 00	6 00	7 00

T SQUARES—Continued.

THE BRAMWELL PERFECT T SQUARE.

A FIXED AND MOVABLE HEAD T SQUARE, COMBINED IN ONLY ONE HEAD.





5029

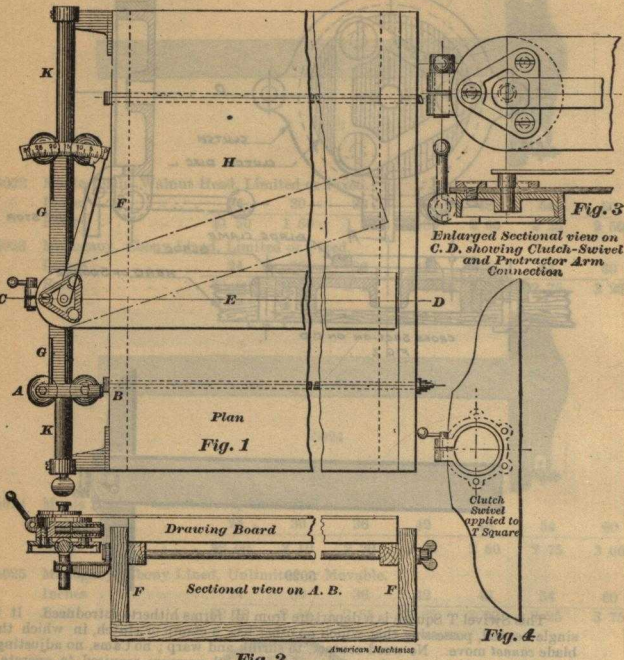
This Swivel T Square is a departure from all forms hitherto introduced. It is single headed, possessing that which no other has, a clamp or clutch, in which the blade *cannot* move. No wood contact, to shrink and warp; no Cams, no adjusting. It has accurately machined metal surfaces; small pressure required to operate; cannot get out of order. A positive stop is arranged for the right angle, so that the blade may be brought to its original position without adjusting. The T square has all the features of a fixed one as well as the useful advantages of a Swivel or movable one.

It consists of a metal "Clutch" accurately bored to receive "Clutch Disc," Fig. 1. The "Clutch" is embedded in head of square and held there by two machine screws, Fig. 2. The "disc" is secured to blade by three machine screws and "Blade Clamps" Fig. 2. The Clutch is sawn through at "A," the ends thus separated are drawn together by Screw "B," Fig. 1. Sufficient friction may be set up to break the Blade before the Clutch will yield. The positive 90-degree stop may be seen on Fig. 3. Blade may be instantly removed and used as Straight Edge. The T Square can be fitted with Protractor attachment, similar to that on Roller Square, page 134.

5029 **BRAMWELL'S** Perfect T Square, Mahogany, Ebony Lined, Shellac Finish.

Inches	30	36	42	48	54	60	72
Each	$2 50	2 75	3 00	3 25	3 50	3 75	4 00

BRAMWELL'S
ROLLER T SQUARE GUIDE.



5030

A very ingenius contrivance for the draughting table. Can be adjusted to any size board and easily manipulated by one hand.

Description.—The Bramwell Square consists of a steel rod *K*, a carriage *G*, and blade *E*. The rod *K*, is supported by brackets and can be fixed to any table or board The carriage has four rollers turned to curvature of bar: two of these rotate upon pins fixed to carriage, the other two upon pins fixed to spring boxes shown in Figure 2. The spring boxes with their rollers slide upon pins secured to carriage and are recessed to receive coil spring: this spring presses against head of pin secured to carriage. and spring box, thereby pulling fixed rollers against bar, preserving continuously a positive, unvarying contact.

BRAMWELL'S ROLLER T SQUARE GUIDE—Continued.

The Swivel for blade is a metal mechanical clutch, absolutely immovable when set.

The Protractor attachment reads to 3 minutes or less. The Arc plate is only 30 degrees. The vernier arm in Figure 3 is held by friction to clutch disc on blade, so that a greater angle than 30 degrees is necessary, it can be moved back by clamping blade. The advantage of this arrangement over other protractors may be readily seen—possible errors reduced from $\frac{1}{4}$ to $\frac{1}{12}$ varying as length of blade, for the blade is virtually the protractor arm.

The important features of the Rolling T Square are: (1) Self-Holding. (2) No varying edge. (3) Freedom from variation due to shrinkage of board and paper. (4) Drawings of any length can be made by passing from right to left. (5) Blade can be instantly converted into straight edge (6) Blade can be swung free of paper. (7) Bar is adjustable vertically for variations in thickness of boards.

5030 **"Bramwell's Roller T Square Guide,"** complete, with Protractor and Vernier reading to 3 minutes. Mahogany, Ebony Lined, Blades from 42 to 60 inches long . . . . . each, $15 00

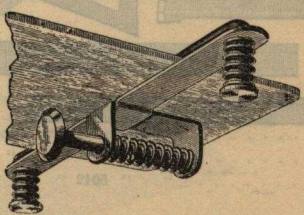
5031 The same as No. 5030, without Protractor . . . . . " 11 00

5032 Blades only for No. 5030, from 42 to 60 inches long . . . . . " 1 75

Note.—The Roller T Square Guide can be screwed on to any Drawing Table or Board. The bar and wooden strip are furnished to fit widths of Drawing Boards from 36 to 48 inches. In ordering please state width of Board to which it is to be attached.

WEED'S PATENT T-SQUARE HOLDER.

F. WEBER & CO., Sole Agents for the United States.

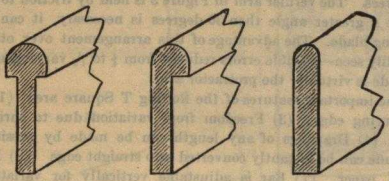


5036

The construction of this attachment is so simple and perfect, that it forms a valuable addition to every T square. The draughtsman is thus relieved of the annoyance of the T square slipping, which with the attachment is firmly held to the drawing-board.

5036 Nickel Plated to fit 2¾- and 3½-inch blade . . . . . each, $ 50

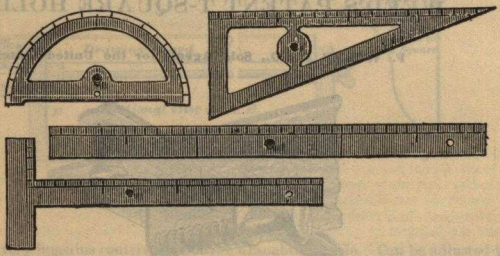
BARS FOR BEAM COMPASSES.



5058 5059 5060

	Inches	24	30	36	42	48	60
5038	Hardwood. Each .	$ 35	40	45	55	65	75
5039	" " .	30	35	40	45	50	65
5040	" " .	20	25	30	35	40	50

BLACK BOARD SET.



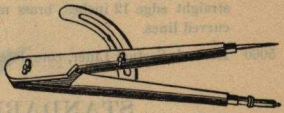
5042

5042 Black Board Set, with Knobs, consisting of T Square, 24 inches; Straight Edge, 36 inches; Protractor, 15½ inches; Triangle, 30 x 60 degrees, 24 inches . . . . . per set, $4 00

WOODEN DIVIDERS.

FOR BLACK BOARD USE.

5046



5047

5045 Wooden Dividers, Maplewood, Ordinary, 16 inches . . . . . each, $ 75

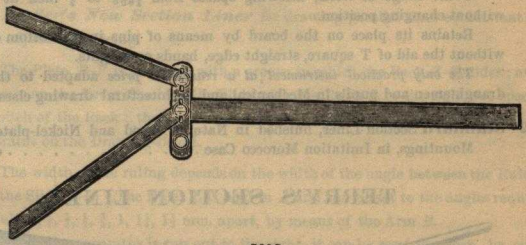
5046 " " Cherrywood, Brass Swivels, Steel Points, Extra Quality,

Length, Inches . . .	12	15	18	24	30
Each	$1 25.	1 50	1 80	2 10	2 50

5047 Wooden Dividers, Cherrywood, Brass Swivels, with Arc and Steel Points,

Length, Inches	12	15	18	24	30
Each	$1 80	2 10	2 50	3 00	3 60

PERSPECTIVE LINEAD.



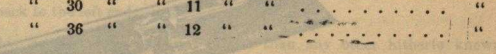
5052

5052S. Maple Blades, 24 inches, arms, 10 inches long . . . . . each, $2 85

5052M. " " 30 " " 11 " " . . . . . " 3 40

5052L. " " 36 " " 12 " " . . . . . " 3 75

ECCENTROLINEAD.



5055

5055 Hard Rubber, German Silver Mountings, 10-inch . . . . . each, $2 75

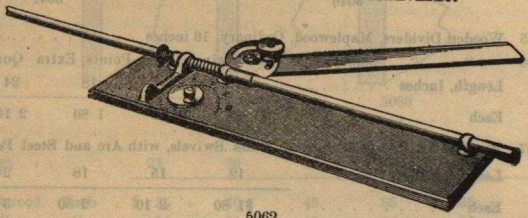
SECTION LINERS.

HEINZE'S SECTION LINER.

A simple and useful Instrument, composed of Pearwood Triangle, 10 inches, and straight edge 12 inches, brass mountings, for all kinds of shading in straight and curved lines.

5060 Heinze's Section Liner, complete, with directions . . . . . each, $1 00

STANDARD SECTION LINER.



5062

Strong, Simple and Durable.

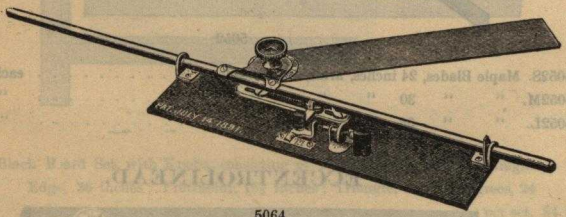
Great range of work, allowing spaces from $\frac{1}{1000}$ to $\frac{1}{2}$ inch at any angle without changing position.

Retains its place on the board by means of pins in the bottom of base and without the aid of T square, straight edge, hands or weights.

The only practical instrument, at a reasonable price adapted to the needs of draughtsmen and pupils in Mechanical and Architectural drawing classes.

5062 **Standard** Section Liner, finished in Natural Wood and Nickel-plated Mountings, in Imitation Morocco Case . . . . . each, $1 50

TERRY'S SECTION LINER.

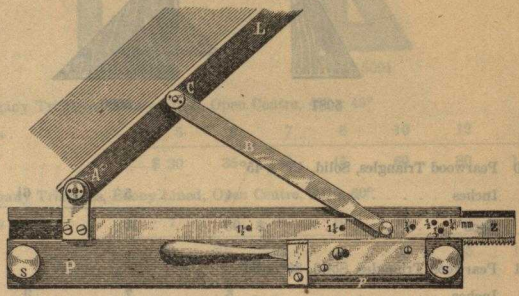


5064

5064 **Terry's** Section Liner, with 7-inch Celluloid Rule . . . . . each, $5 00
5065 " " " " 12-inch Mahogany Rule, with brace attachment . . . . . " 6 50

SECTION LINERS—Continued.

RIEFLER'S SECTION LINER.



5066

Riefler's New Section Liner for drawing parallel lines equidistant and with adjustable spacing.

The Plate *P–P* is provided with a groove in which the Rack *Z–Z* slides; every pressure on the Lever *H* moves the Slide with the Ruler *L* to the right one space of the pitch of the Rack; the needle points and screws on the Base *S–S* secure the apparatus on the Drawing-Board.

The width of the ruling depends on the width of the angle between the Ruler *L* and the Slide *Z–Z*. The Ruler *L* is held in *A* and can be set to the angles required for ruling, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$ mm. apart, by means of the Arm *B*.

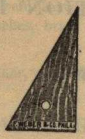
When the apparatus is run out to the right, it can be reset for work, by either pulling the slide out to the right and re-inserting it at the left side, or by releasing the Sprawl from the Rack by pressing on the Screw *V*, and moving the whole Slide back to the left end.

This apparatus gives better results than any other hitherto known; the handling is very simple and easy, requires neither practice nor special ability.

It is made of German silver, best workmanship, and forms an elegant addition to the drafting tools.

5066 **RIEFLER'S** Section Liner, German Silver, Arm $8\frac{1}{2}$ inches, in case . . . **$15 00**

TRIANGLES.



5081

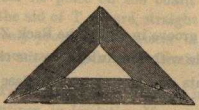
5080

5080 Pearwood Triangles, Solid, 45° x 45°

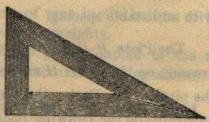
Inches	4	5	6½	
Each	$ 08	10	12	15

5081 Pearwood Triangles, Solid, 30° x 60°

Inches	5	7	9	11
Each	$ 08	10	12	20



5082



5083

5082 Pearwood Triangles, Open Centre, 45° x 45°

Inches	5	6	7	8	9	10	12
Each	$ 18	20	22	25	30	35	40

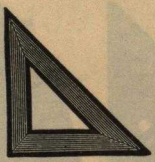
5083 Pearwood Triangles, Open Centre, 30° x 60°

Inches	7	8	9	10	12	14	16
Each	$ 18	20	25	30	35	40	65

Extra Sizes with Cross Bars.

5086 Pearwood, 14 inches, 45° . . . . . each, $1 20
5087 " 21 " 45° . . . . . " 2 50
5088 " 19 " 30° x 60° . . . . . " 1 20

TRIANGLES—Continued.



5090

5091

5090 Mahogany Triangles, Ebony Lined, Open Centre, 45° x 45°

Inches	5	6	7	8	10	12	14
Each	$ 30	35	40	45	60	80	1 10

5091 Mahogany Triangles, Ebony Lined, Open Centre, 30° x 60°

Inches	7	8	9	10	12	14	16
Each	$ 30	35	40	50	65	85	1 10

5095

5097

5099

5095 Hard-Rubber Triangles, Open Centre, 45° x 45°

Inches	3	4	5	6	7	8	9	10	11	12	14	16
Medium thick, each,	$ 18	20	25	30	40	45	50	60	70	80	1 10	1 50
5096 Thick, each,	—	—	—	—	50	60	70	80	95	1 15	1 60	2 00

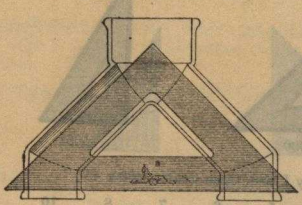
5097 Hard-Rubber Triangles, Open Centre, 30° x 60°

Inches	3	4	5	6	7	8	9	10	11	12	13	14	16
Medium thick, each,	$ 15	18	20	25	30	40	45	50	55	60	—	85	1 20
5098 Thick, each	—	—	—	—	35	45	55	65	75	90	1 00	1 25	1 50

5099 Hard-Rubber Triangles, Open Centre, 22½° x 67½°

Inches	3	4	5	6	7	8	9	10	11	12	14	16
Each	$ 15	18	25	30	35	40	45	50	55	65	90	1 25

TRIANGLES—Continued.



5110

5111

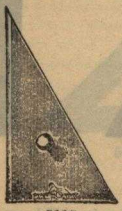
5110 Amber Triangles, Open Centre, 45° x 45°

Inches	4	5	6	7	8	9	10	12	14	16
Each	$ 35	45	55	65	75	90	1 05	1 60	2 00	2 50

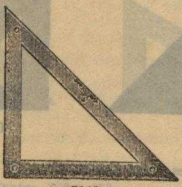
5111 Amber Triangles, Open Centre, 30° x 60°

Inches	4	5	6	7	8	9	10	12	14	16
Each	$ 25	35	40	45	55	60	70	1 00	1 50	2 00

METAL TRIANGLES.



5115



5117

5118

5115 Steel Triangles, Nickel Plated, Solid, with Knob, 30° x 60°

Inches	4	5	6	7	8	10	12	14
Each	$1 00	1 20	1 50	1 80	2 20	2 60	3 00	4 00

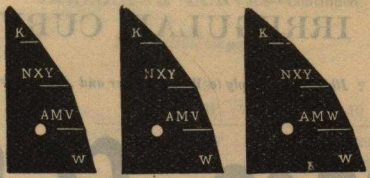
5117 German-Silver Triangles, Open Centre, with Flat Ivory Buttons to Raise From Paper, 45° x 45°

Inches	5	6	7	8	9	10
Each	$1 25	1 50	1 75	2 25	2 75	3 50

5118 German-Silver Triangles, Open Centre, with Flat Ivory Buttons to Raise From Paper, 30° x 60°

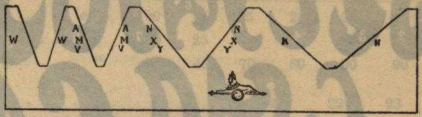
Inches	6	7	8	10	12	14
Each	$1 25	1 50	1 75	2 25	3 00	4 00

LETTERING TRIANGLES.



5120

5120 Lettering Triangles, Hard Rubber, 3½ inches. 3 in a set . . . . . per set, $1 25
5121 " " Transparent Amber, 3½ inches. 3 in a set . . . " 1 75



5122

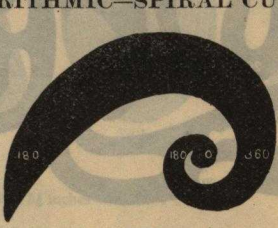
5122 Amber Lettering Templets. 3 in a set . . . . . per set, $2 00

COMBINATION CURVE.

5185

5185 Combination Curve. Hard Rubber . . . . . each, $ 65
5186 " " Transparent Amber . . . . . " 1 00

LOGARITHMIC—SPIRAL CURVE.



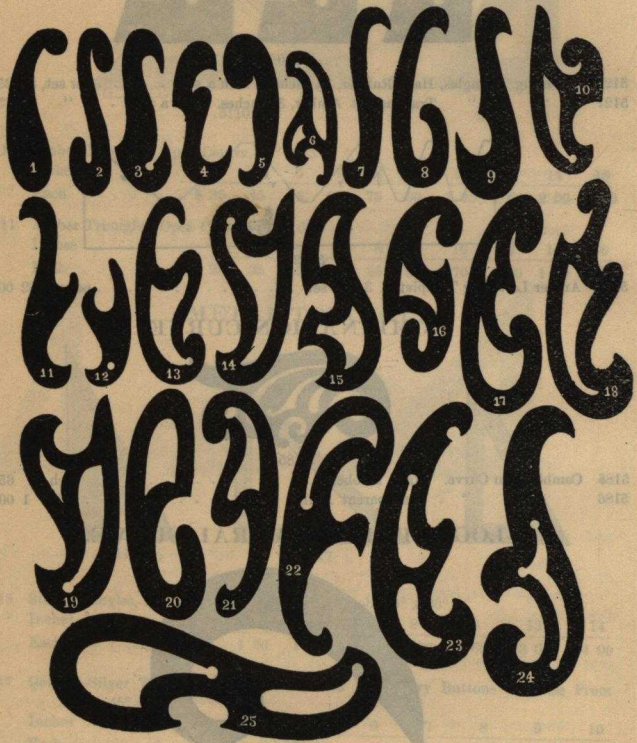
5187

Mathematically correct, all curves within the limit of its size can be made with it.

5187 Spiral Curve. Hard Rubber . . . . . each, $1 25
5188 " " Transparent Amber . . . . . " 1 75

IRREGULAR CURVES.

Illustrations apply to Wood, Rubber and Amber Curves.



For prices, see page 145.

IRREGULAR CURVES—Continued.

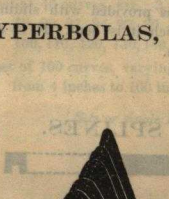
Illustrations, see page 144.

	Nos.	1	2	3	4	5	6	7	8	9	10
	Inches	7	6½	6¼	7	6½	5½	10	8½	8¾	6¾
5195	Pearwood . . . . each, $	12	15	15	18	18	20	20	20	20	25
5196	Hard Rubber . . . "	20	25	25	30	30	30	40	40	40	40
5197	Amber . . . . . "	40	40	45	45	45	50	50	50	55	60

	Nos.	11	12	13	14	15	16	17	18
	Inches	9	7	8	9	9	8	10	11
5195	Pearwood . . . . each, $	20	15	25	25	25	25	30	30
5196	Hard Rubber . . . "	40	25	40	50	45	45	50	60
5197	Amber . . . . . "	55	45	70	80	90	90	1 10	1 10

	Nos.	19	20	21	22	23	24	25
	Inches	11	11	11½	12	12	13	17
5195	Pearwood . . . . each, $	30	30	30	30	35	40	45
5196	Hard Rubber . . . "	60	50	60	60	75	90	1 00
5197	Amber . . . . . "	1 10	1 10	1 10	1 15	1 20	1 20	1 80

HYPERBOLAS, ELLIPSES AND PARABOLAS.



5200

5201

5203

						Wood.	Hard Rubber.	Transparent Amber.
5200	Hyperbolas, 8 to set, 2 to 5½ inches					$1 50	$2 25	$3 50
5201	Ellipses,	6	"	2 " 4½	"	1 25	1 50	2 50
5202	"	10	"	1½ " 6	"	2 00	2 75	4 00
5203	Parabolas,	8	"	1¼ " 5½	"	1 50	2 25	3 50
5204	"	8	"	3¼ "14¼	"	3 00	5 00	8 00

ADJUSTABLE CURVE RULERS.

5207

5208

Can be instantly adjusted and retained to any form of curve. The working edge is made rounded, so that by slightly inclining the pencil two or more parallel curves can be drawn without moving the ruler. In using, it is only necessary to bend it to the outline it is desired to draw.

5207 Curve Ruler, 14½ inches long, ruling edge 10 inches . . . . . each, $1 87
5208 " " 30 " " " " 30 " . . . . . " 2 87

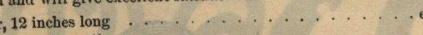
CHEAPER CONSTRUCTION.

5209

The above cut shows a tool which has been added to the regular line of curve rulers in response to numerous inquiries for a low-cost article. In construction it closely resembles the regular 14½-inch tool; it is provided with sliding lead and steel ribbons, and will retain any shape to which it is bent. It is a good and effective tool and will give excellent satisfaction.

5209 Curve Ruler, 12 inches long . . . . . each, $ 87
5210 " " 24 " " . . . . . " 1 50

HARD RUBBER SPLINES.



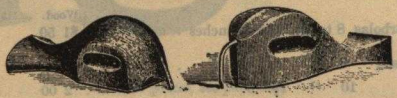
5212

5212 Hard-Rubber Splines, with Groove.

Length, inches	12	18	24	30	36	42	48	60
Each	$ 25	30	35	40	45	50	60	75

Wooden Splines furnished to order.

SPLINE WEIGHTS.



5213 5214

5213 Spline Weight, Japanned Iron, with new style finger . . . . . each, $ 50
5214 " " Lead, with brass finger . . . . . " 85

RAILROAD CURVES.

IN WOODEN BOXES.

5220

HARD RUBBER.

5220 1 set of 10 curves, viz.: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120 inches radius . . . . . per set, $ 7 00

5221 1 set of 17 curves, viz.: 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60 inches radius . . . . . per set, 12 00

5222 1 set of 24 curves, viz.: 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, 10, 12, 14, 16, 18, 20, 22, 24 inches radius . . . . . per set, 17 00

5223 1 set of 43 curves, viz.: 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, 10, 12, 14, 16, 18, 20, 22, 24, 27, 30, 33, 36, 39, 42, 48, 54, 60, 66, 72, 78, 84, 90, 100, 110, 120, 130, 140, 160, 180, 200 inches radius . . . . . per set, 26 00

5224 1 set of 46 curves, viz.: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 24, 27, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200 inches radius, per set, 28 00

5225 1 set of 100 curves, varying ½ inch from 2 inches to 3½ inches; and 1 inch from 4 inches to 100 inches . . . . . per set, 65 00

Sets or single Railroad Curves of any radius made to order.

PEARWOOD.

5230 1 set of 10 curves, viz.: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120 inches radius . . . . . per set, $ 3 50

5231 1 set of 17 curves, viz.: 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60 inches radius . . . . . per set, 6 00

5232 1 set of 24 curves, viz.: 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, 10, 12, 14, 16, 18, 20, 22, 24 inches radius . . . . . per set, 9 00

5233 1 set of 43 curves, viz.: 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, 10, 12, 14, 16, 18, 20, 22, 24, 27, 30, 33, 36, 39, 42, 48, 54, 60, 66, 72, 78, 84, 90, 100, 110, 120, 130, 140, 160, 180, 200 inches radius . . . . . per set, 12 00

5234 1 set of 46 curves, viz.: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 24, 27, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200 inches radius, per set, 15 00

5235 1 set of 100 curves, varying ½ inch from 2 inches to 3½ inches; and 1 inch from 4 inches to 100 inches . . . . . per set, 35 00

RAILROAD CURVES—Continued.

5240

100-FOOT SCALE.

5240 Set of 41 Hard-Rubber Railroad Curves, with Tangent, marked in degrees and inches. Made in Hard Rubber only.

0° .30′ =	114.59	in.	3° .30′ =	16.37	in.	6° .15′ =	9.17	in.	9°	= 6.37	in.
1°	= 57.30	"	3° .45′ =	15.28	"	6° .30′ =	8.82	"	9° .15′ =	6.20	"
1° .15′ =	45.84	"	4°	= 14.33	"	6° .45′ =	8.49	"	9° .30′ =	6.04	"
1° .30′ =	38.20	"	4° .15′ =	13.48	"	7°	= 8.19	"	9° .45′ =	5.88	"
1° .45′ =	32.74	"	4° .30′ =	12.73	"	7° .15′ =	7.91	"	10°	= 5.74	"
2°	= 28.65	"	4° .45′ =	12.07	"	7° .30′ =	7.64	"	10° .30′ =	5.48	"
2° .15′ =	25.47	"	5°	= 11.46	"	7° .45′ =	7.40	"	11°	= 5.22	"
2° .30′ =	22.92	"	5° .15′ =	10.92	"	8°	= 7.17	"	11° .30′ =	4.99	"
2° .45′ =	20.84	"	5° .30′ =	10.42	"	8° .15′ =	6.95	"			
3°	= 19.10	"	5° .45′ =	9.97	"	8° .30′ =	6.75	"			
3° .15′ =	17.63	"	6°	= 9.55	"	8° .45′ =	6.55	"			

In Wooden Box . . . . . per set, $30 00

SEPARATE RAILROAD CURVES.

Pearwood as described above . . . . . each, $ 45
Hard Rubber as described above . . . . . " 75
" " " " " with Tangent . . . . . " 90

COPENHAGEN SHIP CURVES.

IN HARD RUBBER.

For Prices see page 150.

COPENHAGEN SHIP CURVES—Continued.

5245 Hard-Rubber Single Curves.

Nos.	1	2	3	4	5	6	7	8	9	10	11	12
Each,	$1 00	1 00	1 00	1 00	1 00	1 00	1 00	1 10	1 10	70	70	65
Nos.	13	14	15	16	17	18	19	20	21	22	23	
Each	$ 65	65	75	65	45	45	50	50	40	40	40	
Nos.	24	25	26	27	28	29	30	31	32	33	34	
Each	$ 40	40	40	40	30	30	35	30	30	35	35	
Nos.	35	36	37	38	39	40	41	42	43	44	45	
Each	$ 30	30	30	27	22	27	27	27	27	27	22	

Single Pearwood Ship Curves furnished to order.

5246

5246 45 in set, of Hard Rubber, from No. 1 to No. 45, complete . . . . per set, $25 00
5247 45 " . " wood " " 1 " 45, " . . . . " 16 50

COPENHAGEN SHIP CURVES.

FOR MECHANICAL ENGINEERS.

5249 Per set of 10, of Hard Rubber, in box . . . . . per set, $3 75
5250 " " " " " Amber, in box . . . . . " 4 80

DRAWING BOARDS.

MADE FROM SELECTED AND THOROUGHLY SEASONED PINEWOOD.

BEST WORKMANSHIP.

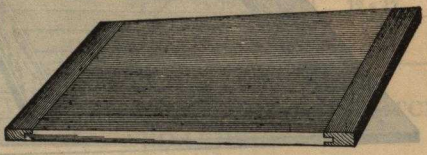
5280 Pinewood, Board ½ inch, with plain screwed ledges, on the back.

Sizes, Inches	16 x 20	18 x 22	20 x 25
Each	$ 50	60	75

5282

5282 Pinewood, Board ½ inch, side ledges, ¾ inch thick.

Sizes, Inches	12 x 16	14 x 18	16 x 20	18 x 22	20 x 25	20 x 28	23 x 31
Each	$ 60	70	80	90	1 00	1 25	1 30



5283

5283 Pinewood, Board ⅞ inch thick, with side ledges flush both sides.

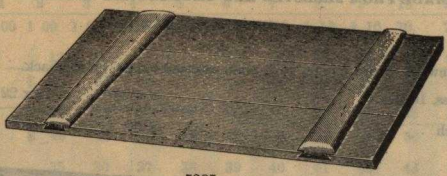
Sizes, Inches	16 x 20	18 x 22	20 x 25	20 x 28	23 x 31	27 x 34
Each	$ 90	1 00	1 15	1 25	1 50	2 00

EXTRA LARGE SIZES.

5284 Pinewood, Boards 1¼ to 1½ inches thick, construction same as No. 5283. These styles are also used on the "**Sphinx**" Drawing-Table.

Sizes, Inches	30 x 44	38 x 54	48 x 64
Thickness, Inches	1¼	1¼	1½
Each	$4 00	5 50	8 00

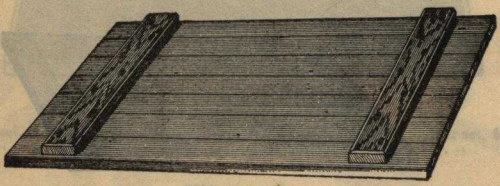
DRAWING BOARDS—Continued.



5285

5285 Pinewood Drawing Board, with hardwood, tapered, dovetailed ledges, on the back. Boards from ½ to ⅞ inch thick.

Sizes, Inches	12 x 16	16 x 20	18 x 22	20 x 25	20 x 28
Each	$ 70	90	1 00	1 15	1 25
Sizes, Inches			23 x 31	27 x 34	31 x 42
Each			$1 50	2 00	2 75



5288

5288 Pinewood Drawing Board, 1 inch thich, made of narrow strips of well-seasoned pinewood, with hard-wood ledges, secured by screws running in oval slots, brass bushings sunk in the ledges, to allow for contraction and expansion of the board. The back of the board is cut half through at every few inches to prevent warping.

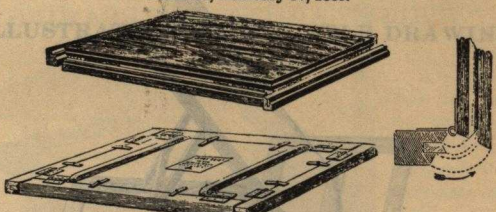
Sizes, Inches	20 x 26	23 x 31	27 x 34	31 x 42	36 x 54
Each	$2 50	3 25	4 00	5 00	7 50

Special sizes made to order in any of the foregoing styles.

DRAWING BOARDS—Continued.

WEBER'S UNIVERSAL DRAWING BOARDS.

Patented, February 17, 1885.



5295

The only framed Drawing Board, that gives a perfect stretch without using any glue or mucilage and has the following advantages:

1st. It possesses absolute durability through the mode of constructing the board and attaching the frame.

2d. The Board is unable to get out of angle, while the frame, adding to the strength, will always form a true edge for the T square.

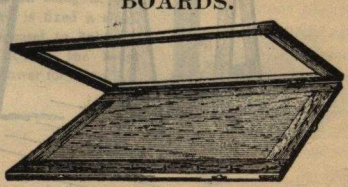
3d. It invariably makes a perfect and smooth stretch, and does away with the gluing of the paper to the surface of the Board.

4th. It will stretch any quality of drawing paper, and saves much time and annoyance in mounting the same, as well as expense for repairing.

5295 Pinewood Panel and Hardwood Folding I edges:

Sizes, Inches	6 x 9	7 x 10	10 x 14	12 x 17	13½ x 20
Each	$1 50	1 75	2 25	2 50	2 75
Sizes, Inches	18 x 22½		18 x 25½	20½ x 28½	25 x 38
Each	3 50		3 75	4 25	5 50

UNIVERSITY WATER-COLOR SKETCH BOARDS.



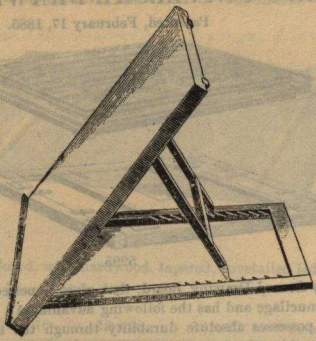
5297

Made of Mahogany, very light in weight, with pins on lower frame, to fasten paper. A very convenient Sketch Board for out-door use. Will hold 3 to 4 sheets of paper.

5297 **"University"** Water-Color Sketch Board:

Sizes, Inches	11 x 15	15½ x 22
Each	$2 75	3 50

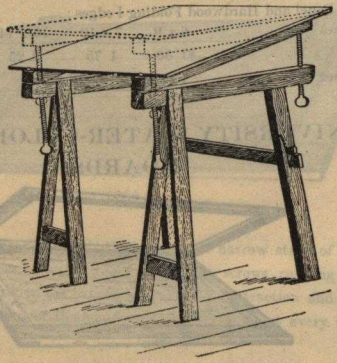
DRAWING DESKS.



5298

5298	Drawing Desk, with easel combined . .	size, 16 x 20	each, $1 75
5299	" " " " and Box for Materials	" 13 x 17 .	" 2 50
5300	" " " " " " " "	" 15 x 20 .	" 2 75

WEBER'S ADJUSTABLE HORSES.



5310

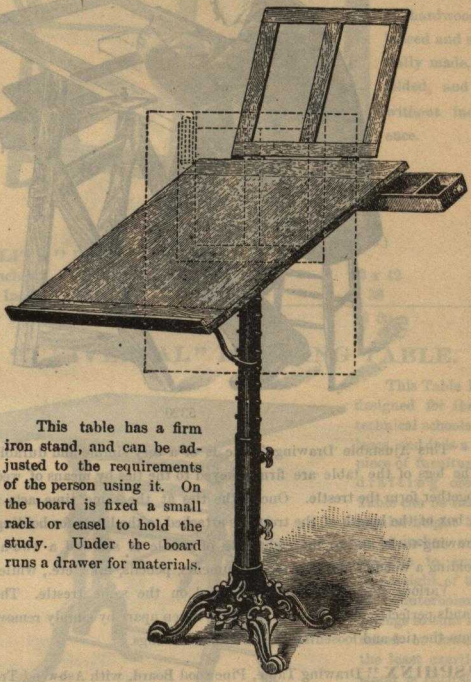
These Horses are made of Ashwood, best workmanship and can be easily adjusted to a slanting or horizontal position by means of the wooden thumb screws to height ranging from 38 to 44 inches.

Each Horse stands on three legs, the rear leg being connected by a crossbar, and thus forms a solid trestle.

5310 Horses complete, with connecting crossbar . . . . . per pair, $7 50

DRAWING TABLES.

ILLUSTRATORS' ADJUSTABLE DRAWING TABLE.



5315

This table has a firm iron stand, and can be adjusted to the requirements of the person using it. On the board is fixed a small rack or easel to hold the study. Under the board runs a drawer for materials.

The easel can be laid flat on the board, and the latter placed perpendicular when not in use.

5315	Table, with Board of Pinewood . size, 20 x 25	each,	$7 00
5316	" " " " " 22 x 31	"	7 50

Boards of Walnut, respectively 50 and 75 cents extra.

DRAWING TABLES—Continued.

"SPHINX" ADJUSTABLE DRAWING TABLE.

5320

This Ajustable Drawing Table is of a very simple and durable construction. The legs of the table are firmly keyed to the ties by means of wedges, and these together form the trestle. One of the ties at the same time acts as a foot rest. A box of the length of the trestle is attached to the latter for holding all necessary drawing-tools, and to the right side of trestle is screwed a two-armed bracket, holding a wooden platform for instruments, pencils, inks, etc., while at work..

Various sizes of boards can be used on the same trestle. The whole table stands perfectly firm, and can be easily taken apart by simply removing the wedges from the ties and loosening the screws on the lugs.

5320 **"SPHINX"** Drawing Table, Pinewood Board, with Ashwood Trestle:

Sizes, Inches	22 x 31	24 x 36	30 x 44	38 x 54	48 x 64
Thickness of Board, Inches	1	1	1¼	1¼	1½
Each	$9 00	10 00	11 50	13 50	16 00

Any other size made to order.

Special prices made for quantities to drawing classes.

DRAWING TABLES—Continued.

"UTILITY" DRAWING TABLE.

5325

5325
(Folded.)

An excellent Table for general use, the Trestle is of hardwood, well braced and substantially made, can be folded, and moved without inconvenience.

5325 "UTILITY" Drawing Table:			
Sizes, Inches	26 x 32	32 x 42	37 x 48
Height, Inches	29	38	38
Each	$3 50	6 00	9 00

"UNIVERSAL" DRAWING TABLE.

5328

This Table has been designed for the use of technical schools and colleges, and it is a valuable piece of furniture for any drafting office. The Table can be raised from regular height 32 inches to 44 inches, and is adjustable to any angle. The weight of the Table is counterbalanced by springs so that it may be raised or lowered with the least exertion. The stand is entirely of iron and blue enamel, it may be screwed to the floor or fitted with castors.

5328 "UNIVERSAL" Drawing Table:			
Sizes, Inches	30 x 42	36 x 48	40 x 60
Each	$18 00	22 50	30 00

Tool Box, attachable, for the above . . . . . each, $2 25

DRAWING TABLES—Continued.

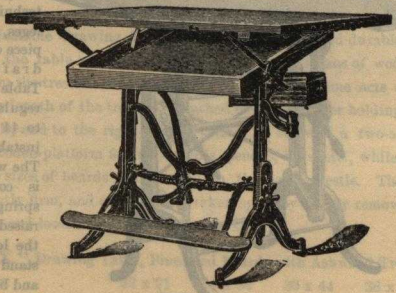
"UNIQUE" DRAWING TABLES.

These Tables comprise all the latest improvements, are of elegant appearance and a handsome and useful companion to any drafting office. The Drawing Board is well finished and constructed in the best possible manner to allow for contraction and expansion. The stand is black enameled, gilt lined.

5330

5330 **"UNIQUE"** Drawing Table, plain, without attachments :

Sizes, Inches .	32 x 42	37 x 48	44 x 60	40 x 72
Each	$15 00	20 00	25 00	30 00



5331

5331 **"UNIQUE"** Drawing Table, with Sketch Box, Swing Shelf and Drawer for tools, Foot Rest and has adjustment for inclining to either side.

Sizes, Inches	32 x 42	37 x 48	44 x 60	40 x 72
Each	$25 00	30 00	35 00	40 00

DRAWING TABLES.—Continued.

5332

5332 **"UNIQUE"** Drawing Table, combining all the advantages of No. 5331, with Cabinet or Case of three drawers, fastened in the rear of the Stand, and circular Swing Tray.

Sizes, Inches	32 x 42	37 x 48	44 x 60	40 x 72
Each	$32 50	37 50	42 50	47 50

SEPARATE PARTS FOR "UNIQUE" DRAWING TABLE.

Foot Rest	each,	$1 50
Circular Swing Tray	"	2 00
Drawer and Shelf	"	3 00
Cabinet, with 3 or 4 Drawers	"	7 00

Larger sizes of the "Unique" Drawing Tables will be furnished to order.

THUMB TACKS.

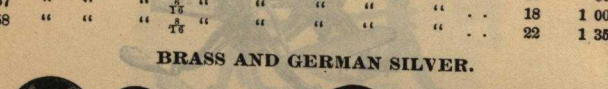
STEEL.

5351 5352 5353 5354

Our Steel Tacks are stamped out of one piece, with a fine point on the pins and enough elasticity to prevent their breaking.

		Per Doz.	Per 100.
5351	Steel Thumb Tacks, $\frac{5}{16}$ inch diameter	$ 08	$ 50
5352	" " " $\frac{6}{16}$ " "	10	60
5353	" " " $\frac{8}{16}$ " "	12	75
5354	" " " $\frac{10}{16}$ " "	16	1 00
5356	" " " $\frac{5}{16}$ " " metal covered, nickeled	15	80
5357	" " " $\frac{6}{16}$ " " " " "	18	1 00
5358	" " " $\frac{8}{16}$ " " " " "	22	1 35

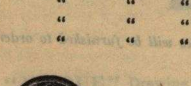
BRASS AND GERMAN SILVER.



$\frac{10}{16}$ $\frac{8}{16}$ $\frac{7}{16}$ $\frac{6}{16}$ $\frac{10}{16}$ $\frac{8}{16}$ $\frac{7}{16}$ $\frac{6}{16}$

Our Brass and German-silver Thumb Tacks are made with the greatest care and of best material. The pins, which are of hardened steel, are screwed in and riveted, which makes them perfectly secure against their being pushed through or coming out. Their edges are thin, to allow the T square to slide over easily.

5360	Brass Thumb Tacks, $\frac{5}{16}$ inch diameter, round head	per doz., $ 10
5361	" " " $\frac{6}{16}$ " "	" 15
5362	" " " $\frac{7}{16}$ " "	" 20
5363	" " " $\frac{8}{16}$ " "	" 25
5364	" " " $\frac{10}{16}$ " "	" 30
5367	" " " $\frac{6}{16}$ " " beveled head	" 15
5368	" " " $\frac{7}{16}$ " " " "	" 20
5369	" " " $\frac{8}{16}$ " " " "	" 25
5370	" " " $\frac{10}{16}$ " " " "	" 30
5372	German-silver Thumb Tacks, $\frac{7}{16}$ inch diameter, round head	" 30
5373	" " " $\frac{8}{16}$ " " " "	" 40
5374	" " " $\frac{10}{16}$ " " " "	" 50
5376	" " " $\frac{7}{16}$ " " beveled head	" 30
5377	" " " $\frac{8}{16}$ " " " "	" 40
5378	" " " $\frac{10}{16}$ " " " "	" 50



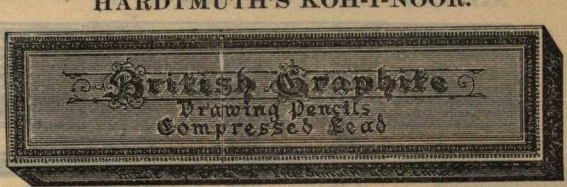
5390

HORN CENTRES.

5390	Horn Centre, $\frac{1}{2}$-inch Diameter	each, $ 12
5391	" " $\frac{3}{4}$ " "	" 15

LEAD PENCILS.

HARDTMUTH'S KOH-I-NOOR.



5450

This Pencil, of a perfection hitherto unapproached, is remarkable for its extreme durability and combines all the improvements in pencil-making up to date.

"**KOH-I-NOOR**" will retain a working point longer than any other pencil and is, therefore, comparatively speaking, the cheapest.

"**KOH-I-NOOR**" is the Best Pencil for Architects, Engineers, Artists, Heraldic Designers, Shorthand Writers, Retouchers, as well as for Book-keepers.

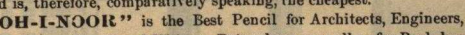
"**KOH-I-NOOR**" does not smear, and is easily erased.

"**KOH-I-NOOR**" suits all purposes being manufactured in 14 different degrees.

5450 "**KOH-I-NOOR,**" Hexagon, Yellow, Polished Cedar :

7H, 6H, 5H, 4H, 3H, 2H, H, F, HB, B, 2B, 3B . . .	each, $	10 . .	per doz., $1 00
4B	"	13 . .	" 1 30
6B	"	15 . .	" 1 50

KOH-I-NOOR ARTIST'S PENCILS.

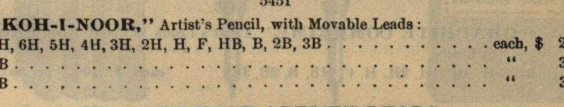


5451

5451 "**KOH-I-NOOR,**" Artist's Pencil, with Movable Leads :

7H, 6H, 5H, 4H, 3H, 2H, H, F, HB, B, 2B, 3B	each, $	25
4B	"	30
6B	"	35

KOH-I-NOOR ARTIST'S LEADS.



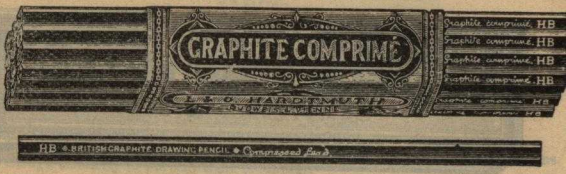
5452

5452 "**KOH-I-NOOR,**" Artist's Leads, in Cedar-Wood Boxes of 6 Leads :

7H, 6H, 5H, 4H, 3H, 2H, H, F, HB, 2B, 3B . . .	each, $	10 . . .	per box, $ 60
4B	"	13 . . .	" 70
6B	"	15 . . .	" 80

LEAD PENCILS—Continued.

HARDTMUTH'S GRAPHITE COMPRIMÉ.

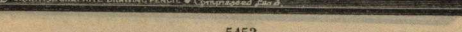


5453

5453 **"GRAPHITE COMPRIMÉ,"** Hexagon, Natural Polished Cedar:

6H, 5H, 4H, 3H, 2H, H, F, HB, B, 2B, 3B	each, $	10	per doz.,	$1 00
4B	"	13	"	1 25
6B	"	15	"	1 50

GRAPHITE COMPRIMÉ ARTIST'S PENCILS.

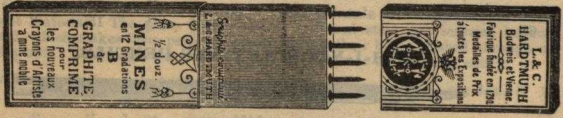


5454

5454 **"GRAPHITE COMPRIMÉ"** Artist's Pencils, with Movable Leads:

6H, 5H, 4H, 3H, 2H, H, F, HB, B, 2B, 3B	each, $	25		
4B	"	30		
6B	"	35		

GRAPHITE COMPRIMÉ ARTIST'S LEADS.



5455

5455 **"GRAPHITE COMPRIMÉ"** Artist's Leads, in Cedar-Wood Boxes of six (6) Leads:

6H, 5H, 4H, 3H, 2H, H, F, HB, B, 2B, 3B	each, $	10	per box, $	60
4B	"	13	"	70
6B	"	15	"	80

HARDTMUTH'S POLYGRADE.

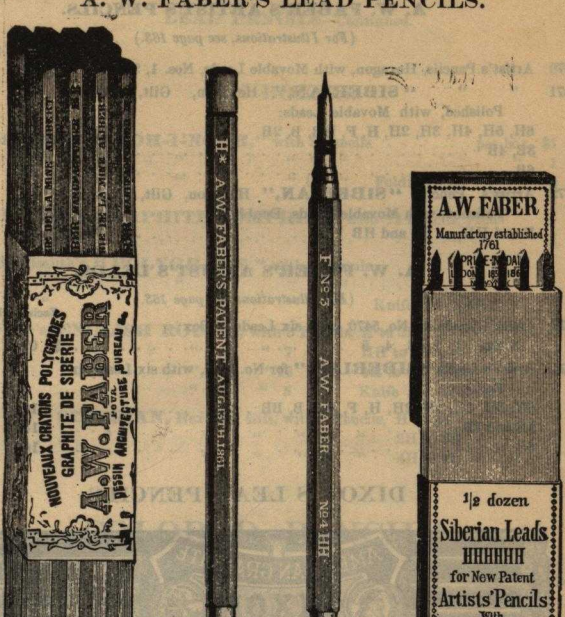
5456

5456 **"POLYGRADE,"** Round, Natural, Polished Cedar:

6H, 4H, 3H, 2H, H, F, HB, B, 2B, 3B, 4B, 6B	each, $	05	per doz.,	$ 50

LEAD PENCILS—Continued.

A. W. FABER'S LEAD PENCILS.



5464 5471 5472 5474

		Each.	Per Doz.
5460	**ROUND GILT,** Black Polished:		
	Nos. 1, 2, 3, 4	$ 05	$ 50
5461	**POLYGRADE ENGLISH ROUND,** Silver Stamped, Natural Polished:		
	6H, 4H, 3H, 2H, H, F, HB, B, 2B, 3B, 4B, 6B	05	50
5462	**HEXAGON GILT,** Red Polished:		
	Nos. 1, 2, 3, 4, 5	07	75
5463	**"SIBERIAN,"** Hexagon. Gilt, Natural Polished.		
	6H, 5H, 4H, 3H, 2H, H, F, HB, B, BB	10	1 00
	3B and 4B	14	1 40
	6B	16	1 60
5466	Mathematical, Round, Black Polished, No. 4, for Compasses	05	50

LEAD PENCILS—Continued.

A. W. FABER'S ARTIST'S PENCILS.

(*For Illustrations, see page 163.*)

		Each.	Per Doz.
5470	Artist's Pencils, Hexagon, with Movable Leads, Nos. 1, 2, 3, 4, 5	$ 18	$1 80
5471	" " **"SIBERIAN,"** Hexagon, Gilt, Natural Polished, with Movable Leads:		
	6H, 5H, 4H, 3H, 2H, H, F, HB, B, 2B	25	2 75
	3B, 4B	30	3 25
	6B	35	3 75
5472	Artist's Pencils, **"SIBERIAN,"** Hexagon, Gilt, Natural Polished, with Movable Leads, Double:		
	F and HH, or BB and HB	40	4 25

A. W. FABER'S ARTIST'S LEADS.

(*For Illustrations, see page 163.*)

		Each.	Per Box.
5473	Artist's Leads for No. 5470, with six Leads in Box:		
	Nos. 1, 2, 3, 4, 5	$ 07	$ 35
5474	Artist's Leads **"SIBERIAN,"** for No. 5471, with six Leads in Box:		
	6H, 5H, 4H, 3H, 2H, H, F, HB, B, BB	10	60
	3B and 4B	14	75
	6B	16	85

DIXON'S LEAD PENCILS.

5482

The **"DIXON"** Pencils are known to be the Best American Pencils, made of the Best American Graphite. They are Black, smooth, strong and evenly graded.

5480 Artist's **PERFECTED GRAPHITE,** Hexagon, Natural Polish.

VVS,	VS,	S,	SM,	MB,
Very, Very Soft.	Very Soft.	Soft.	Soft Medium.	Medium Black.
M,	**MH,**	**H,**	**VH,**	**VVH,**
Medium.	Medium Hard.	Hard.	Very Hard.	Very, Very Hard.

Each . . . . . $ 10 | Per Dozen $1 00

		Each.	Per Doz.
5481	**HEXAGON, GILT.**		
	S, SM, M, H, VH	$ 07	$ 75
5482	**ROUND, GILT.**		
	S, SM, M, H, VH	05	50

LEAD PENCILS—Continued.

IN BOXES.

5485	Hardtmuths' **"KOH-I-NOOR,"** with 5 Pencils . . . . . per box,	$1 00
5486	" " " 7 " . . . . . "	1 25
5487	" " " 10 " Folding Case . . "	2 00
5488	Hardtmuth's **GRAPHITE COMPRIMÉ**, with 12 Pencils, Folding Case . . . . . "	1 80
5490	Hardtmuth's **"POLYGRADE,"** with 5 Pencils . . . . . "	50
5491	" " " 7 " . . . . . "	60
5492	" " " 5 " Knife and Rubber, "	85
5493	Faber's, **ENGLISH ROUND,** with 5 Pencils, H to 2B . . . . . "	55
5494	" " " " 7 " HH to 3B . . . . "	65
5495	" " " " 10 " 4H to 4B . . . . "	80
5496	" " " " 5 " Knife and Rubber "	1 00
5497	" **SIBERIAN,** Hexagon, Gilt, with 5 Pencils, H to 2B . . "	90
5498	" " " " " 7 " 2H to 3B . . "	1 15
5499	" " " " " 10 " 4H to 4B . . "	1 50

COLORED PENCILS.

		Each.	Per Doz.
5505	**SUSSNER'S** Colored Pencils or Wax Crayons, Superfine Quality, made in 54 different colors	$ 10	$ 1 00

SCALE OF THE COLORS.

1 White	17 Japan Red	32 Red Ochre	46 Dark Umber
2 Light Yellow	18 Ultramarine	33 Dark Yellow	49 Finest Carmine
3 Light Blue	19 Scarlet	34 Blue Green	53 Deep Rose
4 Orange	20 Black	35 Blue Violet	54 Madder Lake
5 Japan Brown	21 Sepia	36 Dark Gray	56 Silk Green
7 Ochre	22 Olive	37 Light Gray	57 Viridian
8 Carmine Rose	24 Dark Violet	38 Mineral Blue	59 Mauve
9 Ct. Mort. Brown	25 Raw Sienna	39 Olive Green	61 Prussian Blue
11 Light Green	26 Dark Blue	40 Light Red	63 Chrome Yellow
12 Vermilion	27 Green Yellow	41 Light Carnation	68 Cobalt Blue
13 Dark Green	28 Brown Olive	42 Light Ochre	69 Imperial Blue
14 Red Brown	29 Umber	43 Light Rose	00 Scarlet Lake
15 Green Olive	30 Dark Olive	44 Dark Carnation	
16 Red Violet	31 Sepia Brown	45 Mineral Green	

COLORED PENCILS—Continued.

		Each.	Per Doz.
5506	Colored Pencils, Red or Blue, in White Wood, Extra Thick	$ 06	$ 60
5507	" " " and Blue, Combined, Extra Long	06	60

BLAISDELL'S PAPER PENCILS.

		Each.	Per Doz.
5508	Blaisdell's Paper Pencils, Red Blue and Black	$ 07	$ 75

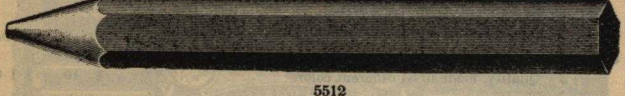
COLORED PENCILS, IN BOXES.

5510 **SUSSNER'S** Superfine, with assorted Shades, in Boxes:

Colors	6	12	18	24
Per doz.	$ 75	$1 25	$1 75	$2 25

ENGINEERS' AND SURVEYORS' CRAYONS.

FOR MARKING STAKES.



5512

		Each.	Per Doz.
5512	Engineers' and Surveyors' Crayons, Hexagon, Red or Blue, 4½ inches long	$ 08	$ 80
5513	Engineers' and Surveyors' Crayons, Round, Red or Blue, 3½ inches long	06	60

"UTILITY" PENCIL HOLDER.

5516

		Each.	Per Doz.
5516	**"UTILITY,"** Pencil Holder, Polished Cedar and Metal Ferrule,	$ 06	$ 60

PENCIL POINTERS.

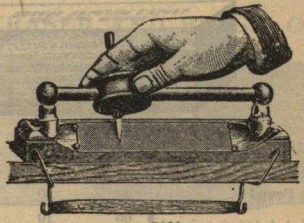
5518

5518 Sand-paper Block, with Handle, size 1¼ x 6 inches . . . . . each, $ 15

5519

This Pencil Pointer being of Emery Paper, mounted on Oval-Shaped Wooden Handle, has many advantages over the old style with flat surface.

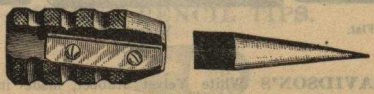
5519 Emery Paper, on Oval-shaped Wooden Handle, size 1¾ x 7 inches . each, $ 20



5520

The Pencil is revolving as it is moved along upon the surface of a file, which is made especially for the purpose. It sharpens Clean, Quick and to any desired point. It can be attached to desk or table, or held in the hand.

5520 Perfect Pencil Pointer . . . . . each, $1 25

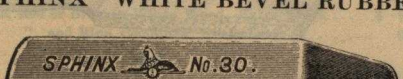


5521

5521 Cartridge Pencil Sharpener . . . . . each, $ 20

RUBBER PENCIL ERASERS.

"SPHINX" WHITE BEVEL RUBBER.



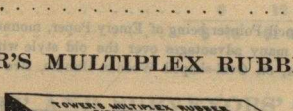
5525

The **"SPHINX"** Rubber is of superior quality, has a Velvet Finish, it does not smear, and erases remarkably well.

5025 **"SPHINX"** White Bevel Rubber, made in 9 sizes :

Pieces to the Pound	120	80	60	40	30	20	12	8	4
Per Piece	$ 02	03	04	06	08	10	15	22	40
Per Pound									$1 30

TOWER'S MULTIPLEX RUBBER.

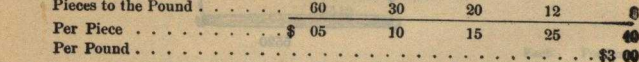


5530

5530 Multiplex Rubber :

Pieces to the Pound	60	30	20	12	6
Per Piece	$ 05	10	15	25	40
Per Pound					$3 00

DAVIDSON'S WHITE VELVET RUBBER.



Flat. Wedge. Oblong.

5534

5534 **DAVIDSON'S** White Velvet Rubber, made in three shapes, *Flat*, *Wedge* and *Oblong*, please state shape when ordering.

Pieces to the Pound	80	60	40	20	12	8	4
Per Piece	$ 03	04	06	10	15	22	40
Per Pound							$1 50

RUBBER PENCIL ERASERS—Continued.

FABER'S ARTIST'S RUBBER.

5535

5535 **FABER'S** White Artist's Rubber, in 8 sizes:

Pieces to the Pound	80	60	40	30	20	12	8	4
Per Piece	$ 04	05	06	08	12	18	25	50
Per Pound								$1 80

5536 **FABER'S** Black Artist's Rubber:

Pieces to the Pound	60	40	20	8
Per Piece	$ 06	09	18	40
Per Pound				$2 50

		Per Oz.	Per Lb.
5537	Pure Virgin Rubber, assorted sizes	$ 20	$2 50

FABER'S ERASER AND BRUSH COMBINED.

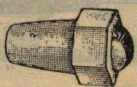
5540

5540 **FABER'S** Pencil Eraser and Brush Combined, Bound in Wood, Small, each, $ 15
5541 " " " " " " " " Mammoth. " 25

FABER'S ERASERS, PENCIL FORM.

5543 **FABER'S** Pencil Eraser, in Wood, Pencil form . . . . . each. $ 12

RUBBER PENCIL TIPS.



5545

		Each.	Per Doz.
5545	Rubber Pencil Tip, Hexagon	$ 02	$ 15

INK ERASERS.

5550

SPHINX INK ERASER.

		Each.	Per Doz.
5550	"SPHINX" Ink Eraser, size, $\frac{3}{16}$ x 1 x 1½ inches,	$ 05	$ 50

TYPEWRITERS' INK ERASER.

5551

		Each.	Per Doz.
5551	Typewriter's Eraser, Wedge-shaped, size, $\frac{7}{16}$ x $\frac{7}{16}$ x 2¾ inches . . .	$ 10	$1 00

5554

FABER'S INK ERASERS.

		Each.	Per Doz.
5554	**FABER'S** Ink Eraser, Small . . .	$ 05	$ 50
5555	" " " Large . . .	10	1 00
5556	" " " Extra Large	18	1 80

FABER'S INK AND PENCIL ERASERS.

5557

5557	**FABER'S** Ink and Pencil Eraser, Combined, set in Wood	each, $ 15
5558	" " " " " Mammoth	" 25

PENCIL FORM.

5559	**FABER'S** Ink and Pencil Eraser, Combined, in Wood	each, $ 15
5560	" Ink Eraser, in Wood	" 12

SPONGE RUBBER.

FOR CLEANING PAPER.

5565

5565	Sponge Rubber: Sizes, Inches	1 x 1 x 1	2 x 3 x 1	3 x 4 x 1	4 x 6 x 1
	Each	$ 10	40	75	1 50
5566	Sponge Rubber, with Solid Back: Sizes, Inches	1¾ x 2⅝ x ½	2 x 3 x 1	3 x 4 x 1	4 x 6 x 1
	Each	$ 25	50	90	1 80

STEEL ERASERS.

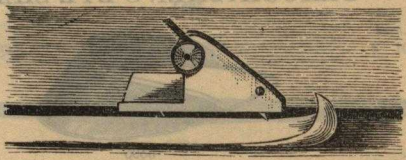
5575

5575 Steel Eraser and Knife, Combined, Blade 2 inches, Coco Handle . . each, $ 50

5576

5576 Steel Eraser, Blade 2 inches, Coco Handle . . . . . each, $ 40

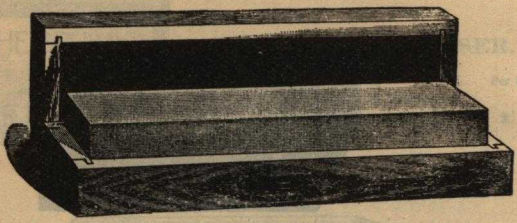
PAPER CUTTER.



5580

5580 Brass Paper Cutter, Steel Blade, for cutting Stretched Drawing Paper, each, $ 50

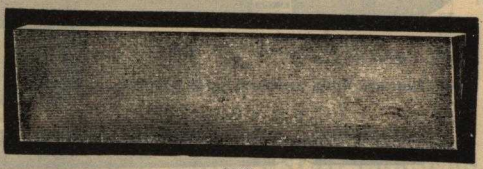
ARKANSAS OIL STONES.



5586

5586	Arkansas Oil Stones, Mounted in Polished Mahogany Case with Cover: Sizes, Inches	3½ x 1	4 x 1½	5 x 2
	Each	$ 75	1 20	2 00
5587	Arkansas Oil Stones, Mounted on Mahogany Wood, with Handles, 4 x 1 inches . . . . . each, $ 60			
5588	Arkansas Oil Stones, Unmounted, 3 to 4½ inches long, x 1 inch to 1¼ inches wide, ⅛ to ⅝ inch thick . . . . . each, from $ 30 to $ 50			

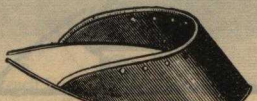
KNIFE BLADE SHAPE.



5590

5590 Arkansas Oil Stones, Knife Blade Shape, Sharp Edge, 3 to 4½ inches long, x ¾ to 1 inch wide, x ⅛ to ¼ inch thick . . . . . each, $ 50

DRAUGHTSMEN'S EYE SHADE.



5595

5595 Draughtsmen's Eye Shade, Extra Quality . . . . . each. $ 15

STEEL PENS
FOR
DRAWING AND LETTERING.

5600

5601

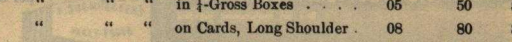
5603

5605

5607

Gillott's No.		Each.	Per Doz.	Gross.
5600 — 290	Gillotts' Mapping, Loose, in Gross Boxes	$ 05	$ 50	$5 00
5600C— 290	" " on Cards, with Holder		55	6 50
5601 — 291	" " Loose, in Gross Boxes	05	50	5 00
5601C— 291	" " on Cards, with Holder		55	6 50
5602 — 170	" " Loose, in Gross Boxes	02	10	1 05
5603 — 303	" " Extra Fine, Loose in Gross Boxes	02	15	1 40
5604 — 404	Gillott's Mapping, with Bead, Fine Point, Loose in Gross Boxes	01	10	75
5605 —1000	Gillott's Drawing Pen, Superfine, on Cards	10	1 10	12 70
5606 — 418	" Lettering " Silvered, Loose in Gross Boxes	02	18	1 85
5607 — 659	Gillott's Crow Quills, on Cards, with Holder		55	6 50
5608 — 659	" " " in ¼-Gross Boxes	05	50	5 00
5609 — 850	" " " on Cards, Long Shoulder	08	80	8 00
5615	Myers' Barrell Mapping Pens, with Holder, on Cards	03	30	3 00
5618	Blanzy, Poure & Co's, Crow Quill Pens, with Holders, on Cards	03	30	3 00
5619	Blanzy, Poure & Co's, Mapping Pen, Loose in Gross Boxes	02	20	2 00

PENHOLDERS.



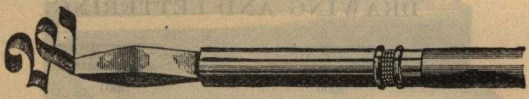
5625

		Each.	Per Doz.
5625	Penholder, Ebony, for Crow Quill, 659 and 850	$ 10	$1 00

5626

		Each.	Per Doz.
5626	Penholder, Polished Cedar Handle for Nos. 290, etc.	$ 02	$ 20

AUTOMATIC SHADING PENS.



5630

5630 Automatic Shading Pens, Nos. 0, 1, 2, 3, 4, 5 . . . . . each, $ 20

SOENNECKEN'S ROUND-WRITING PENS.

5635

5636

5635 Pens, Single Pointed:
Nos. 1, 2, 2½, 3, 3½, 4, 5, 6 . . . per quarter gross, 25 . . per gross, $ 85

5636 Pens, Double Pointed:
Nos. 10, 20, 30, 40, 50, 60, 70, 80, 90, per quar. gross, 65 per doz., 35

5637 Assortment of Single and Double-Pointed Pens, 25 in a Box . . . per box, 35

5640

5640
Attached.

5640 Ink Holders, for Single and Double Pens . . per box of 10, . $ 30 . each, $ 06

SOENNECKEN'S PARALLEL PENS.

5642

5642 Round-writing Parallel Pens and Holder, Complete with 9 Minute Pens . . . . . per set, $1 00

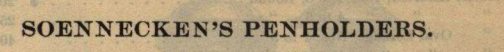
5643 Minute Pens only for No. 5642 . . . . . per dozen, . $ 75 . . each, 10

FLUENT-WRITING PENS.

5645

5645 Fluent writing Pens:
Square Pointed, Nos. 203, 204, 205, 206, 206½, 207, 208.
Oblique Pointed, Nos. 105, 106, 107, 108.
Per quarter gross, ... $ 35 . . . . . per gross, $1 10
5646 Box, Containing 25 Pens of the above, assorted . . . . . per box, 35

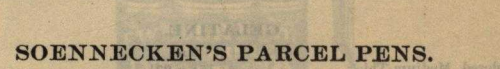
SOENNECKEN'S PENHOLDERS.



5648

5648 Penholders for Round-writing Pens . . . . . each, $ 10
5649 " Double Ends for Round-writing Pens . . . . . " 10

SOENNECKEN'S PARCEL PENS.



5650

5650 Parcel Pens, in 4 Different Widths, for Bold and Large Lettering,

Nos.	131	133	135	137
Width, Inches	1/16	1/8	1/4	3/8

Each . . . . . $ 25

METHODICAL TEXT AND COPY BOOKS

ON ROUND WRITING.

5652 Methodical Text-book on Round Writing, by F. Soennecken, including an Assortment of 25 Single and Double-Pointed Pens, per copy, $1 00
5653 Methodical Text-Book on Round Writing, without Pens . . . . " " 65
5654 Copy Books, without Instructions (School Edition), Nos. 1, 2, 3, 4, 5, including an Assortment of 25 Pens . . . . . " " 70
5655 Copy Books, without Pens . . . . . " " 35

LITHOGRAPHIC MATERIALS.

CRAYONS.

Lemercier's, Nos. 1, 2, 3	per dozen,	$ 30
Vanhymbeck's, Nos. 1, 2, 3	" "	30
Currier's, Nos. 1, 2, 3	" "	30
Conté's, Nos. 1, 2, 3	" "	30
" Extra Fine, Nos. 1, 2, 3, in Polished Cedar Wood, each, $ 10,	" "	1 00
Copal Crayons	" "	45

NEEDLES, ETC.

	Each.	Per Doz.
Needles, Assorted, Nos. 1 to 3, Round	$ 20	$2 40
" " " 4 to 6, "	25	3 00
" Oval Lozenge, Nos. 1 to 3	40	4 00
" " " 4 to 6	45	4 50
" Square " " 1 to 3	40	4 00
" " " " 4 to 6	45	4 50
" Flat, Nos. 1 to 2	40	4 00
" " " 3 to 4	45	4 50
Awls, 5 Edge, Assorted, Nos. 1 to 3	35	3 50
" 5 " " " 4 to 6	45	4 50
Parallel Needle-holders	2 00	

GELATINE.

	Size.	Per Sheet.
Colored, Medium Thick	15½ x 23½	$ 25
No. 2, White, Medium	15½ x 23½	25
No. 4, " Thick	15½ x 23½	35

INDIA PAPERS.

	Size.	Per Sheet.	Per Quire.
French India Paper, H Buff, and D Pale Buff, Sized	28 x 43	$ 22	$4 25
" " " H " " D " " Unsized	28 x 43	15	3 00
India Paper, Buff	24 x 52	12	2 25
" " Thin, White, for Wood Engravers	12½ x 44	08	1 50

SCRATCH BOARDS.

Heavy, 22 x 28 inches	per sheet, $ 40

HAND-STIPPLED OR AUTOGRAPHIC PAPERS.

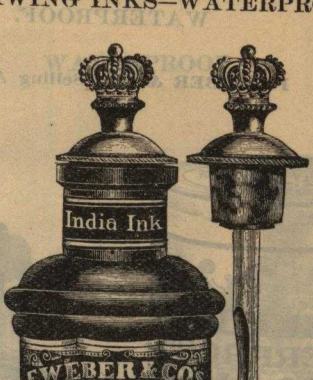
	Size.	Per Sheet.	Per Doz.
Ross', Nos. 1, 1½, 2, 3, 8, 9, 12, 16, 18, 19	11 x 14	$ 30	$3 00
" " 1, 2, 3, 4, 6, 7, 10, 11, 13, 14, 15	14 x 22	50	5 00
" " 1, 2 and 3	22 x 28	75	7 50
" " 4, Black	11 x 14	50	3 00
" " 1, 6, 11, Black	14 x 22	50	5 00

For Engravers' and Etchers' Materials, see our General Catalogue of Artists' Materials.

LIQUID DRAWING INKS.

F. WEBER & CO'S "CROWN"

DRAWING INKS—WATERPROOF.



5700

5700 "Crown" Drawing Inks . . . . . per bottle, $ 25
5701 "Crown" Drawing Inks, ½ pint, Black or colored . . . . . " 1 75
Made in the following colors:

Black Waterproof	Brown	Red
Black Soluble	Green	Scarlet
Blue	Purple	Yellow

"CROWN" DRAWING INKS IN SETS.

5702 Set of Crown Drawing Inks, containing 7 bottles of the above Colored Inks, in Polished Mahogany Box . . . . . per set, $2 25

BLUE-PRINT INKS.

5705 Blue-Print Inks, for Marking on Blue Prints, in three colors, White, Red, Yellow . . . . . per bottle, $ 20

Special Prices in Dozen and Gross Lots.

LIQUID DRAWING INKS—Continued.

S. & H. INDIAN INK.

WATERPROOF.

F. WEBER & CO., Selling Agents.

Box, Showing Style of Package.

Bottle, Showing Quill and Stopper.

5710

S. & H. Waterproof India Ink is an entirely new composition; the result of a long series of careful experiments, and is not based upon any previous formula. It has stood the most rigid and extended tests; in competition with the high-grade Chinese Stick Ink and the Best Liquid Drawing Inks to be had, and the results have proved conclusively that, while not inferior to any ink now used, it is superior in many points to the liquid drawing inks heretofore offered.

S. & H. Waterproof India Ink is put up as shown in above illustrations. Each bottle is packed in cardboard box, sealed with our label, and each dozen bottles are packed in lock-cornered wooden box

5710 S. & H. Waterproof India Ink . . . . . per bottle, $ 25
5711 " " " " in ½ pints . . . . . " " 1 75

Special Prices in Dozen and Gross Lots.

LIQUID DRAWING INKS—Continued.

HIGGINS' & BOURGEOIS'

WATERPROOF.

5715

5718

5715	Higgins' Drawing Ink, Black or Colored . . . . . per bottle,	$ 25
5716	" " " " " ½ pint . . . . . " "	2 00

Made in the following colors:

Black	Brown	Green	Scarlet
Blue	Carmine	Indigo	Vermilion
Brick Red	General, or Waterproof Yellow	Orange	Violet

5718	Bourgeois' Indian Ink, Small . . . . . " "		15
5719	" " " Medium . . . . . " "		25

Special Prices in Dozen and Gross Lots.

LIQUID DRAWING INKS—Continued.

WINSOR & NEWTON'S

WATERPROOF.

5725

5725 Winsor & Newton's Waterproof Drawing Ink, 1-oz. . . . . per bottle, $ 25

Made in the following colors:

Black	Carmine	Scarlet	Ultramarine
Brick Red	Purple	Turquois Green	Vermilion
		Yellow	

Special Prices in Dozen and Gross Lots.

CHINESE OR INDIAN INK IN STICKS.

5740 5742 5745 5750 5751 5762

5740	Chinese, Large Figured	3½ x ⅞ x ⅝ inches	each, $1 50
5742	" Genuine Super Super., Small	2⅛ x ½ x ½ "	" 50
5743	" " " " Large	3¾ x 9/16 x 11/16 "	" 1 00
5744	" Elephant Figure, ½ Size		" 40
5745	" " " Small	3½ x ⅜ x ⅜ inches	" 75
5746	" " " Large	3⅝ x 13/16 x ⅜ "	" 1 25
5748	" Medium, Square, Plain		" 1 00
5750	" Lion Head, Oval, Fine Quality, 40 to pound		" 20
5751	" " " Small, Round, Gilt, 64 "		" 15
5753	" Small, Square, 40 to pound		" 10
5754	" " " 60 "		" 06
5760	Japanese, Extra Fine, Soft and Jet Black, B		" 45
5761	" " " " " " D		" 45
5762	" " " " " " E		" 70

Nos. 5740, 5744, 5745, 5746 are of an extra fine quality

CHINESE OR INDIAN INK IN STICKS—Continued.

COLORED.

5765

5765 Colored Indian Inks, with Dragon Figure in five (5) colors :

Blue (Prussian Blue)	each,	$ 25
Brown (Burnt Sienna)	"	25
Yellow (Chrome Yellow)	"	25
Red (Vermilion)	"	25
Lake (Crimson Lake)	"	40

MUCILAGE.

FOR MOUNTING DRAWING PAPERS.

5780

5781

5780 Higgins' Drawing-Board Mucilage, in Glass Jars.

Size	3 oz	6 oz.
Each	$ 15	25

5781 Higgins' Photo Mounter, in Glass Jars,

Size	3 oz.	6 oz.
Each	$ 15	25

5782 Higgins' Taurine Mucilage, in Bottles,

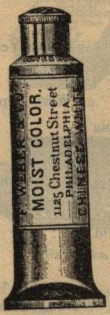
Size	2 oz.	4 oz.	Quarts.
Each	$ 10	20	80

5785 Le Page's Glue,

Size	Large.	Small.
Each	$ 10	20

F. WEBER & CO'S

MOIST AND CAKE WATER COLORS.



Tube.

Glass Pot

Bottle.

Half Pan

Whole Pan

Half Pans	each, $ 10	Tubes	each, $ 15
" Cakes	" 10	Bottles	" 25
Whole Pans	" 20	Glass pots, with lid	" 25
" Cakes	" 20		

5800	Antwerp Blue	Chrome Orange	*King's Yellow	Raw Sienna
	Bistre	*Dragon's Blood	Lamp Black	Raw Umber
	Blue Black	Emerald Green	Light Red	*Red Lead
	Brown Ochre	*Flake White	Mauve	Roman Ochre
	Brown Pink	Gamboge	Naples Yellow	Sap Green
	*Burnt Roman Ochre	Hooker's Green, No. 1	Neutral Tint	Terre Verte
	Burnt Sienna	Hooker's Green, No. 2	New Blue	Vandyke Brown
	Burnt Umber	Indian Red	Olive Green	Venetian Red
	Chinese White	Indigo	Payne's Gray	Vermilion
	Chrome Yellow	Italian Pink	Prussian Blue	Yellow Lake
	Chrome Yellow, Deep	Ivory Black	Prussian Green	Yellow Ochre

*Those marked * are made in whole and half cakes only.*

F. WEBER & CO'S WATER COLORS—Continued.

Half Pans . . . . . each, $	18	Tubes . . . . . each, $	25
" Cakes . . . . . "	18	Bottles . . . . . "	35
Whole Pans . . . . . "	.35	Glass Pots, with lid . . . . "	35
" Cakes . . . . . "	35		

5801 Brown Madder, Cerulean Blue, Crimson Lake, Mars Yellow, Orange Vermilion, Purple Lake, Geranium Lake, Rose Carthame, Ruben's Madder, Scarlet Lake, Roman Sepia, Scarlet Vermilion, Sepia, Warm Sepia

Half Pans . . . . . each, $	25	Tubes . . . . . each, $	40
" Cakes . . . . . "	25	Bottles . . . . . "	50
Whole Pans . . . . . "	50	Glass Pots, with lid . . . . "	50
" Cakes . . . . . "	50		

5802 Cobalt Blue, Cadmium Yellow, Cadmium Orange, Indian Purple, Indian Yellow, Intense Blue, French Blue, Lemon Yellow, Mars Orange, Orange Crap Lake, Oxide of Chromium, Pure Scarlet, Violet Carmine

Half Pans . . . . . each, $	35	Tubes . . . . . each, $	60
" Cakes . . . . . "	35	Bottles . . . . . "	75
Whole Pans . . . . . "	70	Glass Pots, with lid . . . . "	75
" Cakes . . . . . "	70		

5803 Aureolin, Aurora Yellow, Burnt Carmine, Carmine, Extra Deep Crap Lake, Madder Carmine, Pink Madder, Purple Madder, Rose Madder, Rose Madder, Yellowish, Rose Madder, Deep

For Technical Water Colors, see page 186.

WINSOR & NEWTON'S
MOIST AND CAKE WATER COLORS.

Half Pan.

Whole Pan.

Half Cake.

Whole Cake.

Half Pans . . . . . each, $ 12	Whole Pans . . . . . each, $ 24
" Cakes . . . . . " 12	" Cakes . . . . . " 24

5810	Antwerp Blue	Chrome Yellow	Indigo	Prussian Blue
	Bistre	Chrome Yellow, Deep	Italian Pink	Prussian Green
	Blue Black	Chrome Orange	Ivory Black	Raw Sienna
	*British Ink	Cologne Earth	*King's Yellow	Raw Umber
	*Bronze	*Constant White	Lamp Black	Roman Ochre
	Brown Ochre	*Dragon's Blood	Light Red	Sap Green
	Brown Pink	Emerald Green	Mauve	Terre Verte
	Burnt Sienna	*Flake White	Naples Yellow	Vandyke Brown
	Burnt Umber	Gamboge	Neutral Tint	Venetian Red
	Charcoal Gray	Hooker's Green, No. 1	New Blue	Vermilion
	Chinese White	Hooker's Green, No. 2	Olive Green	Yellow Lake
	Chrome Lemon	Indian Red	Payne's Gray	Yellow Ochre

Half Pans . . . . . each, $ 20	Whole Pans . . . . . each, $ 40
" Cakes . . . . . " 20	" Cakes . . . . . " 40

5811	Alizarine Crimson	Crimson Lake	Orange Vermilion	Scarlet Lake
	*Black Lead	Indian Yellow	Purple Lake	Scarlet Vermilion
	Brown Madder	Leitch's Blue	Roman Sepia	Sepia
	Cerulean Blue	Mars Yellow	Ruben's Madder	Warm Sepia
		Neutral Orange		

Half Pans . . . . . each, $ 27	Whole Pans . . . . . each, $ 54
" Cakes . . . . . " 27	" Cakes . . . . . " 54

5812	Cadmium Yellow	Cobalt Green	Lemon Yellow	Permanent Violet
	Cadmium Yellow, Pale	French Blue	Mars Orange	Pure Scarlet
	Cadmium Orange	Indian Purple	Oxide of Chromium	Violet Carmine
	Cobalt Blue	Intense Blue	Permanent Mauve	Viridian (Veronese Green)

*Those marked * are made in whole and half Cakes only.*

WINSOR & NEWTON'S WATER COLORS—Continued.

	Half Pans . .	each, $ 40	Whole Pans	each, $ 80
	" Cakes .	" 40	" Cakes	80
5813	Aureolin	Carmine	Pink Madder	Rose Madder
	Aurora Yellow	Field's Orange Vermilion	Primrose Aureolin	Scarlet Madder
	Burnt Carmine	Madder Carmine	Purple Madder	Yellow Carmine
	Half Pans . . .	each, $ 65	Whole Pans . .	each, $1 30
	" Cakes	" 65	" Cakes	" 1 30
	Smalt		Ultramarine Ash	
5814	Genuine Ultramarine, Quarter Cakes			each, $2 00
	" " Half Cakes			" 4 00

F. WEBER & CO'S

TECHNICAL MOIST WATER COLORS.

IN GLASS POTS, WITH GLASS LIDS.

5820

Our Technical Moist Colors are especially put up for the profession for tinting drawings in structural work, and are strongly recommended for their richness of color and evenness of tint.

	No.		No.		No.	
5820	1	Cast Iron	7	Leather	13	Prussian Blue
	2	Wrought Iron	8	Light Wood	14	Gamboge
	3	Steel	9	Dark Wood	15	Yellow Ochre
	4	Copper	10	Brick	16	Vermilion
	5	Brass	11	Stone	17	Chinese White
	6	Machinery	12	Brownstone	18	Carmine

Nos 1–17 . . . . . each, $ 25 | No. 18, Carmine . . . . . $ 75

F WEBER & CO'S

DISTEMPER OR DESIGNER'S MOIST WATER COLORS.

5825 In Glass Jars, with Metal Cover, Finely Ground in Water

5825.

Blacks.

	Each
Blue Black	$ 15
Ivory Drop Black	15
Lamp Black	15

Blues.

Antwerp Blue	25
Cobalt Blue	75
Prussian Blue	25
Ultramarine Blue	20
Indigo Blue	50

Browns.

Burnt Sienna	15
Burnt Umber	15
Raw Sienna	15
Raw Umber	15
Vandyke Brown	15

Greens.

Chrome Green, Medium	20
" " Deep	20
Emerald "	30
Olive Green	20
Terre Verte	20

Lakes.

Carmine Lake	75
Crimson "	50
Geranium "	50
Magenta "	50
Maroon "	50
Scarlet "	50
Yellow "	50
Orange "	50

Reds.

American Vermilion	20
English " Light	60
" " Dark	60
Indian Red	15

Reds—Continued.

	Each.
Light Red	$ 20
Turkey "	25
Tuscan "	20
French Carmine	85

Whites.

Cremnitz White	20
" " in Large Jars	25
Flake White	20
" " in Large Jars	25

Yellows.

Chrome Yellow, Light	20
" " Medium	20
" " Deep	20
" Orange	20
Naples Yellow, Light	35
" " Deep	35
Dutch Pink	20
Golden Ochre	15
Yellow "	15

The above Colors put up in Larger Jars at Special Prices.
Others Colors made to order.

MOIST CHINESE WHITE.

IN BOTTLES.

5830

5833

5834

F. WEBER & CO'S

5830 Permanent Chinese White . . . . . per Bottle, $ 25

WINSOR & NEWTON'S

5832 Permanent Chinese White, Small . . . . . per Bottle, $ 16
5833 " " " Large . . . . . " " 30

DR. FR. SCHOENFELD & CO'S

5834 Permanent Chinese White . . . . . per Bottle, $ 30

Special Prices in Dozen Lots furnished on Application.

WATER COLOR LIQUIDS.

5838 5839

5838 **F. WEBER & CO'S** Water Color Liquids.

Carmine	Oxgall
Gold Ink	Silver Ink

Per Bottle . . . . . $ 25

Gum Water, 1 oz. . . per bottle, $ 10 | Gum Water, 2 oz. . . per bottle, 15

5839 **WINSOR & NEWTON'S** Water Color Liquids, Small Size.

Asphaltum	Lamp Black	Sepia
Carmine	Oxgall	Silver Ink
Gold Ink	Prout's Brown	Vermilion
	Prussian Blue	

Per Bottle . . . . . $ 16

5840 **WINSOR & NEWTON'S** Water Color Liquids, Large Size.

Asphaltum	Lamp Black	Sepia
Carmine	Oxgall	Silver Ink
Gold Ink	Prout's Brown	Vermilion
	Prussian Blue	

Per Bottle . . . . . $ 30

JAPANNED TIN BOXES—EMPTY.

FOR MOIST WATER COLORS.

5856

5850	Japanned Tin Box for 12 Half Pans . . . . . each,	$ 75
5851	" " " " 18 " " . . . . . "	1 00
5852	" " " " 24 " " . . . . . "	1 25
5853	" " " " 6 Whole Pans or 12 Half Pans . . . . . "	75
5854	" " " " 8 " " " 16 " " . . . . . "	90
5855	" " " " 10 " " " 20 " " . . . . . "	1 00
5856	" " " " 12 " " " 24 " " . . . . . "	1 10
5858	" " " " 18 " " " 36 " " . . . . . "	1 25
5860	" " " " 24 " " " 48 " " . . . . . "	1 50

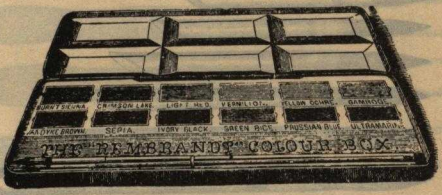
5862

5862	Japanned Tin Box for 18 Octagon Glass Pots . . . . . each,	$1 50
5863	" " " " 24 " " " . . . . . "	1 80

For Moist Colors, see pages 183 and 188.

JAPANNED TIN BOXES, WITH MOIST COLORS.

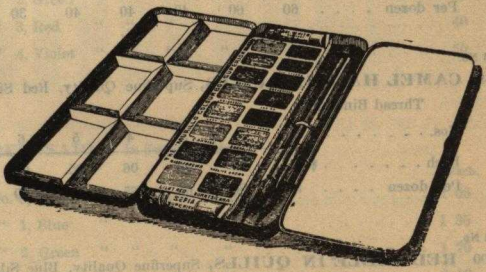
THE REMBRANDT.



5871

5870 Rembrandt Water-Color Box, containing 6 Pans Moist Colors . . . per Box, $ 25
5871 " " " " Large, containing 12 Pans Moist Colors and Brushes . . . . . " " 40

THE MURILLO.

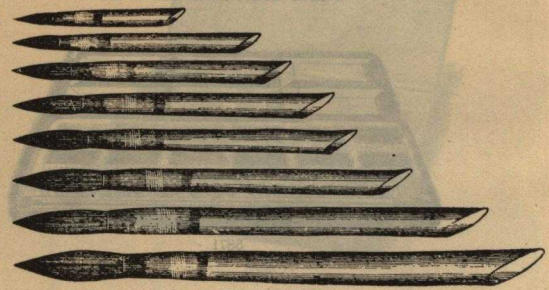


5873

5872 Murillo Water-Color Box, Small, containing 12 Pans and 2 Tubes Moist Colors and Brushes . . . . . per Box, $ 60
5873 Murillo Water-Color Box, Large, containing 16 Pans and 2 Tubes Moist Colors and 4 Camel-Hair Brushes . . . . . " " 90

BRUSHES.

Illustrations Full Size.



5900–5908

Old No.

5900—6 **CAMEL HAIR IN QUILLS,** Fine Quality, Blue Silk Thread Binding.

Nos.	1	2	3	4	5	6	7	8
Each	$ 06	06	04	04	04	03	03	03
Per dozen	60	60	40	40	40	30	30	30

Old No.

5904—9 **CAMEL HAIR IN QUILLS,** Superfine Quality, Red Silk and Gold Thread Binding.

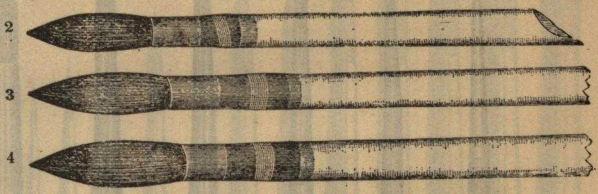
Nos.	1	2	3	4	5	6	7	8
Each	$ 08	08	06	06	05	05	04	04
Per dozen	80	80	65	65	50	50	40	40

Old No.

5908—90 **RED SABLE IN QUILLS,** Superfine Quality, Blue Silk and Silver Thread Binding.

Nos.	1	2	3	4	5	6	7	8
Each	$ 85	70	55	45	33	25	18	14
Per dozen	10 00	8 20	6 60	5 20	4 00	3 00	2 20	1 60

BRUSHES—Continued.



5912–5916

Old No.

5912—14 **CAMEL HAIR** in Swan Quills.

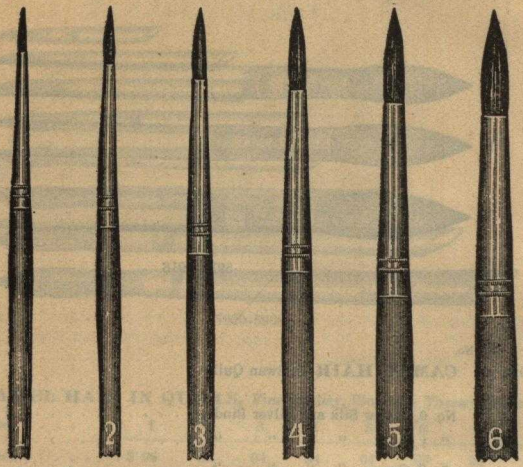
	Each.	Per Doz.
No. 0, Yellow Silk and Silver Binding	$ 13	$1 50
" 1, Blue " " " "	17	2 00
" 2, Green " " " "	28	3 25
" 3, Red " " " "	40	4 75
" 4, Violet " " " "	50	6 00

Old No.

5916—91 **RED SABLE** in Swan Quills.

	Each.	Per Doz.
No. 0, Yellow Silk and Silver Binding	$1 05	$12 50
" 1, Blue " " " "	1 35	15 85
" 2, Green " " " "	1 70	20 25
" 3, Red " " " "	2 10	25 50
" 4, Violet " " " "	2 65	31 75

BRUSHES—Continued.



5920-5924

Old No.

5920—12 F. W. & CO'S CAMEL HAIR, Superfine in Tin Ferrules.

Nos.	1	2	3	4	5	6
Each	$ 06	06	07	08	09	10
Per dozen	60	65	75	85	1 00	1 10

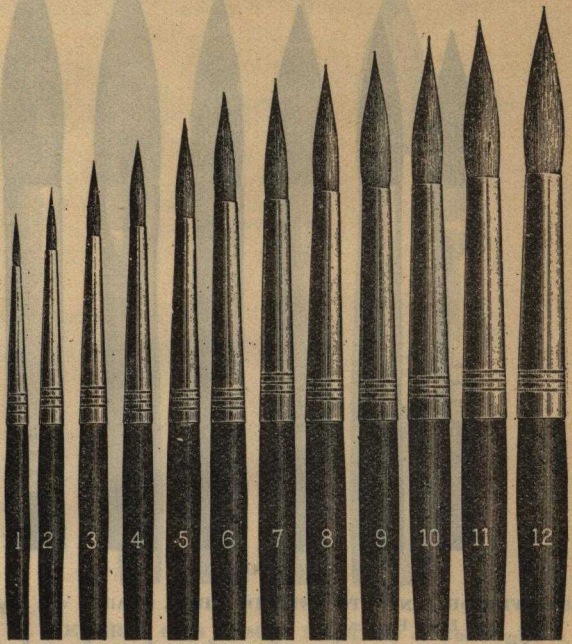
Old No.

5924—77 F. W. & CO'S FITCH HAIR, in Albata Polished Handles.

A very desirable brush where a substitute for Red Sable is required.

Nos.	1	2	3	4	5	6
Each	$ 10	12	14	16	18	20
Per dozen	1 00	1 20	1 40	1 60	1 80	2 00

BRUSHES—Continued.



5928–5933

Old No.

5928—93 **F. W. & CO'S RED SABLE,** in Albata with Black Polished Handles.

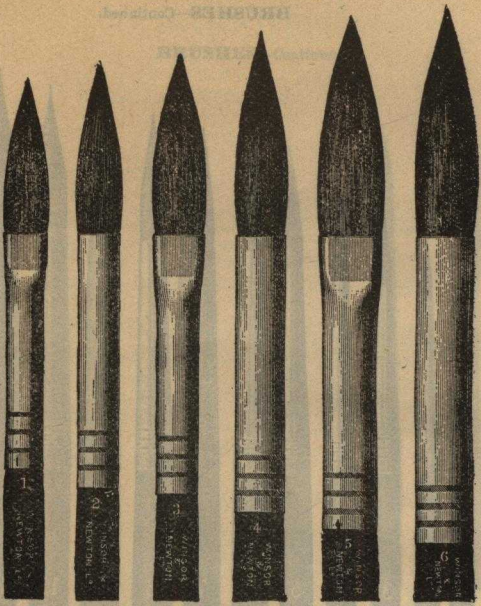
Nos.	1	2	3	4	5	6	7	8	9	10	11	12
Each	$ 12	15	20	25	35	45	55	70	85	1 10	1 35	1 70

Old No.

5933—86 **F. W. & CO'S BROWN SABLE,** in Albata with Black Polished Handles.

Nos.	1	2	3	4	5	6	7	8	9	10	11	12	14
Each	$ 15	20	25	35	45	60	85	1 20	1 60	2 00	2 50	3 25	4 00

BRUSHES—Continued.



5941-5943

5936 **WINSOR & NEWTON'S RED SABLE,** in Albata with Black Polished Ebony Handles.

Nos.	1	2	3	4	5	6	7
Each	$ 40	45	55	65	80	1 00	1 20

5939 **WINSOR & NEWTON'S BROWN SABLE,** in Albata with Black Polished Ebony Handles.

Nos.	1	2	3	4	5	6	7
Each	$ 40	45	60	70	85	1 00	1 30

EXTRA LARGE SERIES.

5941 **WINSOR & NEWTON'S BROWN SABLE, ROUND,** in Albata, with Polished Ebony Handles.

Nos.	1	2	3	4	5	6
Each	$2 40	3 45	4 20	5 40	6 90	7 80

5943 **WINSOR & NEWTON'S BROWN SABLE, FLAT,** in Albata, with Black Polished Ebony Handles.

Nos.	1	2	3	4	5	6
Each	$1 80	2 70	3 60	4 50	5 70	6 90

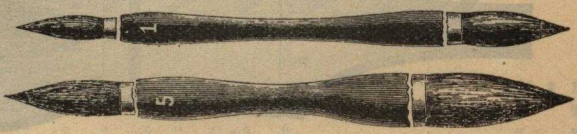
BRUSHES—Continued.

5946

Old No.

5946—16 **F. WERER & CO'S CAMEL HAIR,** Sky or Wash Brushes, in Tin, Superfine, with Yellow Polished Handles.

Nos. . .	00	0	1	2	3	4	5	6
Each .	15	17	20	24	28	32	36	40



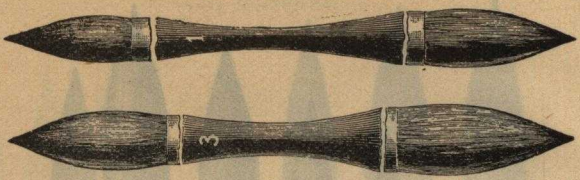
5950

Old No.

5950—117 **F. WEBER & CO'S SUPERFINE CAMEL HAIR,** Sky or Wash Brushes, Double, in Tin with Black Polished Handles.

Nos.	1	3	5
Each	25	33	40

BRUSHES—Continued.

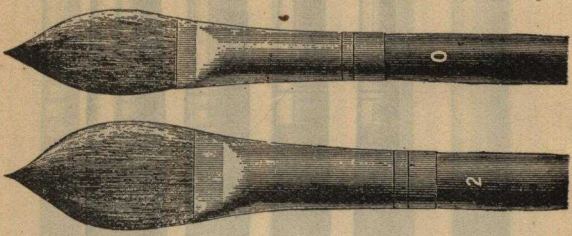


5951

Old No.
5951—17 **F. WEBER & CO'S SUPERFINE CAMEL HAIR,** Sky or Wash Brushes, Double, in Tin, with Yellow Polished Handles.

LARGE SERIES.

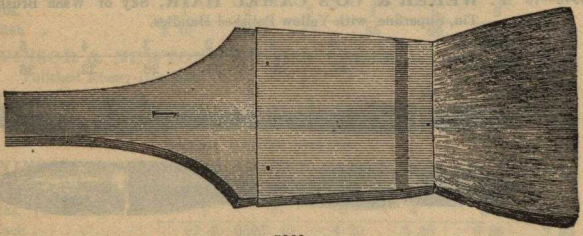
Nos.	0	1	2	3
Each	$ 45	50	55	60



5954

Old No.
5954—50½. **F. WEBER & CO'S SIBERIAN CAMEL HAIR,** Sky Brushes, **Flat,** in Tin, with Black Polished Handles.

Nos.	0	1	2	3
Each	$ 40	50	58	65



5960

Old No.
5960—56 **F. WEBER & CO'S FLAT CAMEL HAIR** Varnish or Coating Brushes, in Tin, with Cedar Handles.

Width, Inches	½	1	1½	2	2½	3	3½	4
Each	$ 20	30	45	55	65	80	95	1 10

CHINAWARE.

COLOR CUPS.

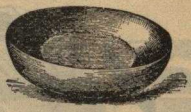
6000

6000 China Color Cups, Plain.

Diameter, Inches	1	1½	1½	1¾	2	2½
Each	$ 01	02	03	04	05	06
Per Dozen	15	20	30	40	50	60

Diameter, Inches	2½	2¾	3	3½	3½	4
Each	$ 07	08	10	12	15	20
Per Dozen	70	85	1 00	1 20	1 50	2 00

TINTING SAUCERS.

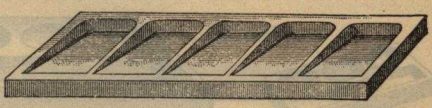


6002

6002 China Tinting Saucers.

Diameter, Inches	1½	2	2½	3	3½	4
Each	$ 03	03½	04	04½	05	06
Per Dozen	30	35	40	45	50	55

COLOR SLANTS.

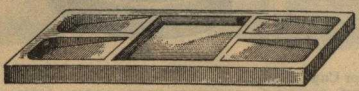


6007

6005	China Color Slants, 3 Slopes,	2½	x 4	inches	. . . . .	. each, $	15
6006	" " "	4	"	3	x 8	"	. . . . .	"	25
6007	" " "	5	"	3½	x 8	"	. . . . .	"	35
6008	" " "	6	"	3½	x 8	"	. . . . .	"	40
6009	" " "	8	"	6⅜	x 7¾	"	. . . . .	"	50
6010	" " "	10	"	6⅜	x 7¾	"	. . . . .	"	60
011	" " "	12	"	6	x 7¾	"	. . . . .	"	70

CHINAWARE—Continued.

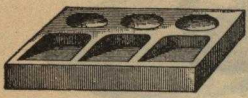
CENTRE COLOR SLANT.



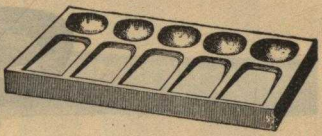
6015

6015 China Centre Color Slant, 5 Divisions, $2\frac{3}{8}$ x 6 inches . . . . . each, $ 20

INK AND COLOR SLABS.

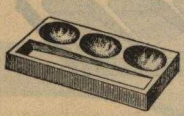


6018

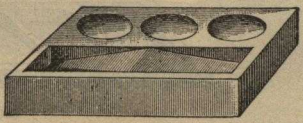


6019

6018 China Ink and Color Slab, 3 Wells and 3 Slopes, $2\frac{1}{2}$ x 4 inches . . . . each, $ 18
6019 " " " " " 5 " " 5 " $4\frac{1}{4}$ x $7\frac{3}{4}$ " . . . . " 55



6023

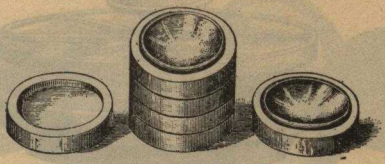


6026

6023 China Ink Slabs, 3 Wells and 1 Slope, $1\frac{1}{2}$ x $2\frac{3}{4}$ inches . . . . . each, $ 10
6024 " " " 3 " " 1 " $2\frac{3}{4}$ x $4\frac{1}{2}$ " . . . . . " 20
6025 " " " 3 " " 1 " 3 x $4\frac{1}{2}$ " . . . . . " 30
6026 " " " 3 " " 2 " $3\frac{3}{8}$ x $5\frac{1}{8}$ " . . . . . " 40

CHINAWARE—Continued.

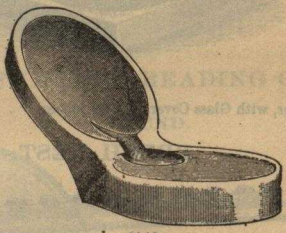
CABINET NEST SAUCERS.



6030

6030	China Cabinet Nest Saucers, 6 in Set, 2⅝ inches Diameter											each, $	45
6031	"	"	"	"	6	"	2¾	"	"	. . . . .		"	55
6032	"	"	"	"	6	"	3¼	"	"	. . . . .		"	65
6033	"	"	"	"	6	"	3¾	"	"	. . . . .		"	70

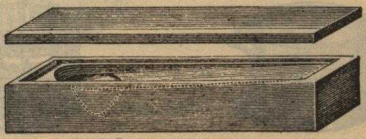
INK WELL SLAB.



6040

6040 China Ink Well Slab, Reversible . . . . . each, $ 20

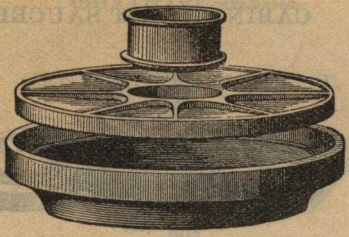
INK SLABS.



6042

6042 China Ink Slab, with Cover, 1¾ x 4½ inches . . . . . each, $ 35
6043 " " " " " 2½ x 5½ " . . . . . " 40

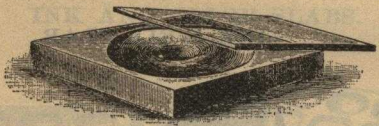
ARCHITECT'S BASIN.



6045

6045 Architect's China Color Basin with 8 Slopes and Centre Cup 7 inches diameter . . . . . each, $1 10

SLATE INK SAUCER.



6050

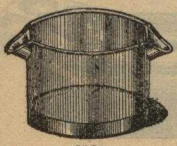
6050 Slate Ink Saucer, with Glass Cover, 3½ x 3½ inches . . . . . each, $ 35

BRUSH REST.

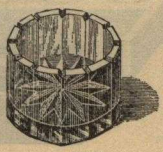
6055

6055 China Brush Rest, 5½ inches . . . . . each, $ 15

WATER GLASSES.



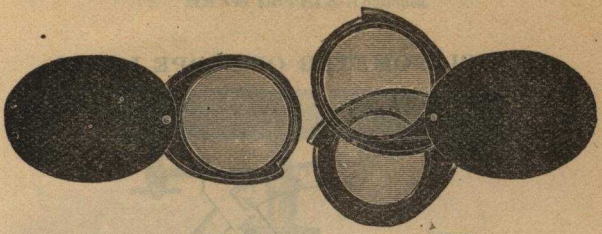
6060



6064

6060	Water Glass with two lips 2½ inches diameter							each, $	15
6061	"	"	"	"	3	"	"	"	20
6062	"	"	"	"	3½	"	"	"	25
6064	"	"	Fine cut for color boxes, 2½ inches diameter, 1¼ inches high					"	15

POCKET MAGNIFYING GLASSES.



6080 6081.

6080 Mounted in Hard Rubber, Oval Pattern, 1 Lens.

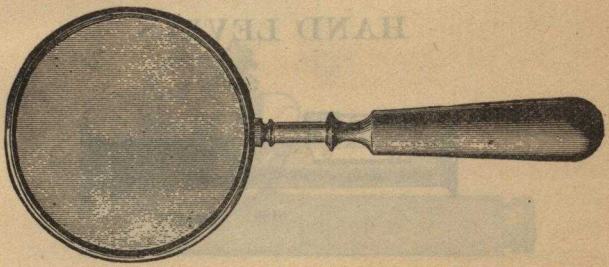
Diameter, inches	¾	1	1¼	1½
Each	$ 30	35	50	60

6081 Mounted in Hard Rubber, Oval Pattern, 2 Lenses.

Diameter, inches	⅝ and ¾	⅞ and 1	1⅛ and 1¼	1¼ and 1½
Each	$ 50	60	90	1 10

MAGNIFYING OR READING GLASSES.

ROUND.



6086

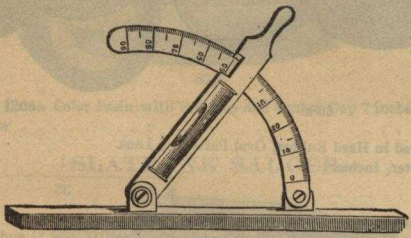
6086 Magnifying Glass, Ebony Handle, German Silver Frame.

Diameter, inches	2	2½	3	3½	4	4½
Each	$ 70	1 00	1 15	1 60	2 00	2 65

6088 Engraver's Diminishing Glasses.

Diameter, inches	2	3
Each	$2 00	4 00

CLINOMETER OR SLOPE LEVEL.



6150

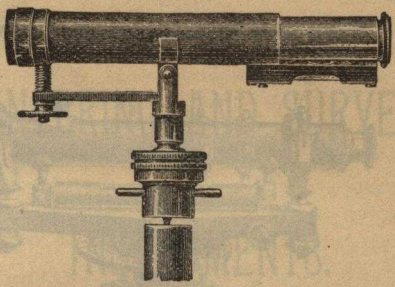
6150 Clinometer or Slope Level with Folding Arc and Perpendicular Sight, each, $15 00

HAND LEVELS.

6160

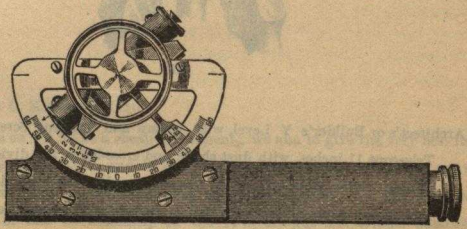
6160 Locke's Hand Level, Brass $7 00
6161 " " " " Second Quality 4 00
6162 " " " German Silver 8 00

HAND LEVELS—Continued.



6165

6165 Reflecting Hand Level, Micrometer Adjustment with Socket and Ball Joint for Jacob Staff . . . . . each, $9 00



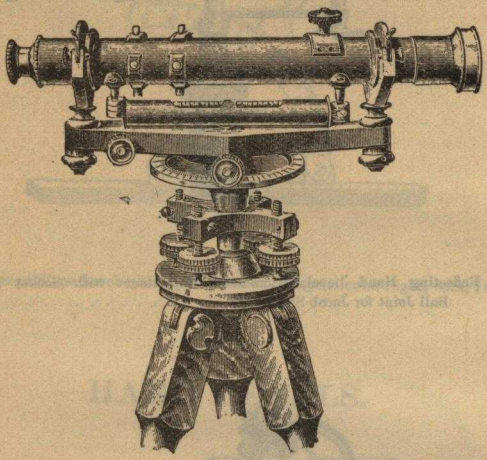
6165

6170 Abney's Reflecting Hand Level or Pocket Altimeter with Graduated Arc Giving Angles of Elevation and Slopes, in Wooden Case . . each, $13 50

6171 Abney's Reflecting Hand Level or Pocket Altimeter Improved with Compass and Socket for Jacob Staff . . . . . each, $18 00

IMPROVED ARCHITECT'S LEVELS.

WITH NEW SPRING TANGENT MOVEMENT.



6180

6180. Architect's or Builder's Y Level, with Clamp and Tangent Screws, Telescope 11 inches, with dust shade and cross-hairs, fine divided bubble, object glass with rack movement, adjustable eye-piece. Horizontal circle 3 inches divided to degrees with vernier reading to 5 minutes.

Instrument Complete with Metal Trivet, Plumb Bob, and Adjusting Pins, in Polished Mahogany Box, with Tripod . . . . . each, $45 00

6182 Architect's or Builder's Y Level same as above, with compass divided to degrees, fine needle, horizontal circle 3 inches divided to degrees, vernier reading to 5 minutes.

Instrument complete with Tripod, etc. . . . . each, $60 00

IMPROVED

ENGINEERING AND SURVEYING

INSTRUMENTS.

Manufactured for

F. Weber & Co., by F. C. Knight & Co.

MR. F. C. KNIGHT'S Letter:

We do not make a cheap instrument; we aim to give the very best instrument possible for the price, and do not care to compete with such as are not up to our standard. We feel confident that, upon investigation, you will find the practicability of and workmanship on the F. C. Knight and Draper Instruments, far superior to all others. In construction of instruments, we use none but the best metals and materials; employ expert mechanical skill only, and use the latest improved machinery, thereby attaining the highest possible standard of excellence. We positively guarantee the accuracy and workmanship of all instruments of our make.

IMPROVED ENGINEERING AND SURVEYING INSTRUMENTS—Continued.

The business to which we are successors, was originated in 1815 by Edmund Draper, under whose ownership and extremely successful management it was continued for over sixty-seven years, during which time he invented many of the most valuable engineering instruments now in use. His establishment was the leading and largest plant of its kind in the United States. His trade not only extended throughout the United States, but also largely in Central America and South America, while his name was by no means unknown in Europe. Since succeeding to the business, our endeavor has been to keep the Draper Instruments up to their original high standard,-adding, from time to time, several modern improvements.

The F. C. Knight Instrument is of an entirely different pattern from the Draper, as will be seen by comparing the cuts in the catalogue. Many of the principal features of this instrument were originated by the person whose name it bears. The part that needs special mention is the new style of clamp and tangent movement; the utility and superiority of this over all others now in use, can be readily discerned and appreciated.

The object accomplished by this clamp is the overcoming of the possibility of springing the horizontal limb in clamping and unclamping, which has never been positively accomplished heretofore, the cut and description of which you will find on page 214.

DRAPER

IMPROVED TRANSIT.

The Draper Transits are so well and favorably known the world over, that they need no special introduction from us. They have been made for over fifty years, with improvements added from time to time, that have kept them up to the requirements of the day. Since becoming the successors to Mr. Draper, the march of improvement has not been lost sight of; it has been our endeavor to make the instrument warrant what it is now termed—a "Draper Improved."

IMPROVEMENTS AND GENERAL DESCRIPTION.

Improvements.—Long centres for short centres; adjustment added to standard for vertical plane of telescope; opposing spring to clamp instead of the opposing screw; have put cups to the leveling screws and covered all the threads to tangent and leveling screws, making them dust-proof. These improvements make this Transit superior to any instrument now offered for a like price.

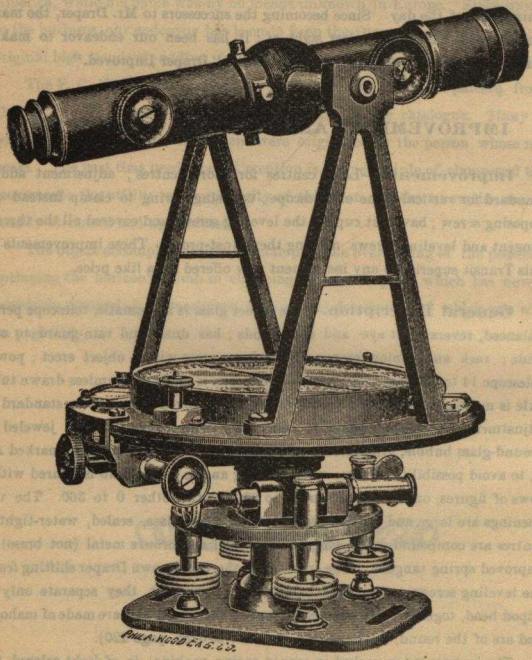
General Description.—The object glass is achromatic, telescope perfectly balanced, reversing at eye- and object-ends; has dust- and rain-guard to object-slide; rack and pinion movement to focus cross-wires; object erect; power of telescope 14 to 20 diameters; body of telescope is made of seamless drawn tubing; axle is made of the best bell metal, fitted into grooved bearings in standard with adjustment for vertical plane of telescope; compass-needle with jeweled cap; ground-glass bubble, graduated. Horizontal limb has two verniers, marked A and B, to avoid possibility of error when reading angles. The limb is figured with two rows of figures, one into quadrants 0 to 90, and the other 0 to 360. The vernie openings are large and covered with French plate-glass, sealed, water-tight; the centres are compound,-extra long, made of bell and bronze metal (not brass); has improved spring tangent. The tripod is of the well-known Draper shifting feature; the leveling screws are not detachable from instrument, they separate only from tripod head, together with the instrument. The tripod legs are made of mahogany, and are of the round, solid pattern (see cut No. 6285, page 220).

The instrument is packed in case in spring packing, is of light-colored wood, hand-polished; has strap and lock; is provided with reading-glass, plumb-bob, lever and screw-driver.

DRAPER IMPROVED PLAIN TRANSIT.

MANUFACTURED FOR

F. WEBER & CO. BY F. C. KNIGHT & CO.



6210–6211

Knight's No.

6210—10 DRAPER IMPROVED PLAIN TRANSIT.

For General Description, see page 208.

Special Description:

Telescope, Length	10½ inches.
Object-Glass, Aperture	1¼ "
Compass Needle	4½ "
Lower Limb	6½ "
Weight of Instrument and Tripod	18 pounds.
Complete	$160 00

6211—11 DRAPER IMPROVED PLAIN TRANSIT.

(SMALL.)

For General Description, see page 208.

Special Description:

Telescope, Length	7½ inches.
Object-Glass, Aperture	⅞ "
Compass Needle	3 "
Lower Limb	4¾ "
Weight of Instrument and Tripod	10 pounds.
Complete	$140 00

Extras to Nos. 6210 and 6211 Transits:

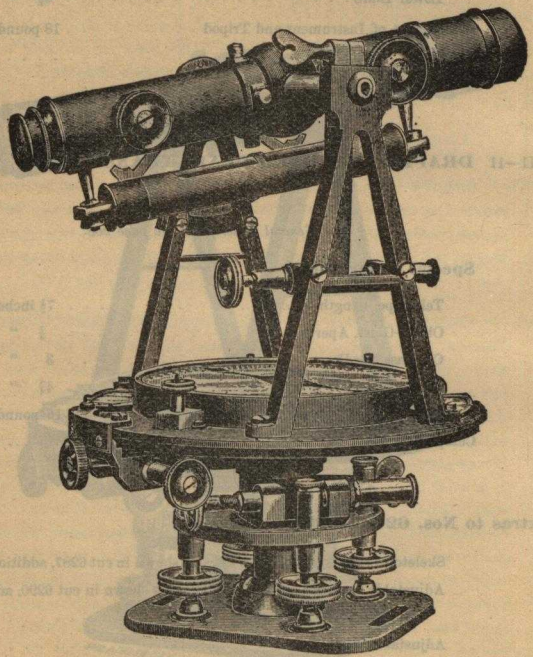
Skeleton Legs instead of Solid Legs, as shown in cut 6287, additional,	$1 50
Adjustable Legs instead of Solid Legs, as shown in cut 6290, additional	6 50
Adjustable Stadia Wires	8 00
Reflector for Illuminating Cross Wires (see cut 6295)	4 00
Gossamer Waterproof Bag to Protect Transit	1 00

We Repair Instruments of any Make Promptly and Accurately.

DRAPER IMPROVED TRANSIT, WITH VERTICAL ARC.

MANUFACTURED FOR

F. WEBER & CO. BY F. C. KNIGHT & CO.



6212–6213

Knight's No.

6212—12 DRAPER IMPROVED TRANSIT WITH VERTICAL ARC.

For General Description See Page 208.

Special Description:

Telescope, Length . . . . . 10½ inches.
Object-Glass, Aperture . . . . . 1¼ "
Bubble under Telescope . . . . . 6½ "
Vertical Arc, Radius . . . . . 6½ "
Figured 0 to 60 each way.
Clamp and Opposing Spring Tangent to Axle of Telescope.
Compass Needle . . . . . 4½ "
Lower Limb . . . . . 6½ "
Weight of Instrument and Tripod . . . . . 19 pounds.
Complete $195 00

6213—13 DRAPER IMPROVED MINING TRANSIT WITH VERTICAL ARC.

For General Description See Page 208.

Special Description:

Telescope, Length . . . . . 7½ inches.
Object-Glass, Aperture . . . . . ⅞ "
Bubble under Telescope . . . . . 4½ "
Vertical Arc, Radius . . . . . 5 "
Figured 0 to 60 each way.
Clamp and Opposing Spring Tangent to Axle of Telescope.
Compass Needle . . . . . 3 "
Lower Limb . . . . . 4¾ "
Weight of Instrument and Tripod . . . . . 11 pounds.
Complete $170 00

Extras to Nos. 6212 and 6213 Transits:

Skeleton Legs Instead of Solid Legs, as Shown in cut 6287, additional, $1 50
Adjustable Legs Instead of Solid Legs, as Shown in cut 6290, additional 6 50
Adjustable Stadia Wires 8 00
Reflector for Illuminating Cross Wires (see cut 6295) 4 00
Gossamer Water-Proof Bag to Protect Transit 1 00

F. C. KNIGHT TRANSIT,

WITH FULL VERTICAL CIRCLE.

MANUFACTURED FOR

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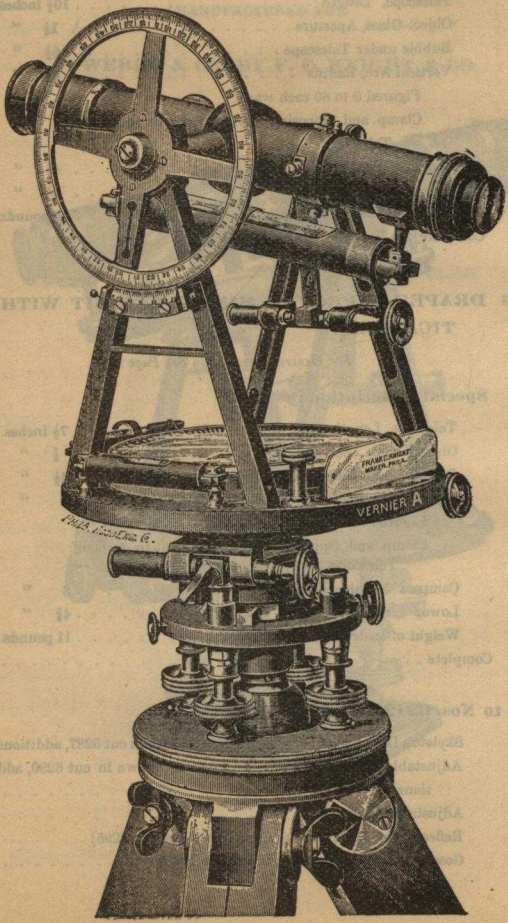


Knight's No.

6226—26 **F. C. KNIGHT TRANSIT AND LEVELING INSTRUMENT, WITH FULL VERTICAL CIRCLE.**

For General Description, see pages 218-220.

Special Description:

Telescope, Length	11 inches.
Object-Glass, Aperture	1¼ "
Bubble under Telescope	7 "
Vertical Circle, Diameter	5½ "
Figured into Quadrants, 0 to 90, with adjustable Vernier reading to Minutes.	
Clamp and Opposing Spring Tangent to Axle of Telescope	
Compass Needle	5 "
Lower Limb	6½ "
Weight of Instrument and Tripod	24 pounds.
Complete	$255 00

Knight's No.

6227-27 **F. C. KNIGHT MOUNTAIN TRANSIT, WITH FULL VERTICAL CIRCLE.**

For General Description, see pages 218-220.

Special Description:

Telescope, Length	9 inches.
Object-Glass, Aperture	1 "
Bubble under Telescope	5½ "
Vertical Circle, Diameter	4 "
Figured into Quadrants, 0 to 90, Vernier (not adjustable) reading to minutes.	
Clamp and Opposing Spring Tangent to Axle of Telescope.	
Compass Needle	4 "
Lower Limb	5½ "
Weight of Instrument and Tripod	16 pounds.
Complete	$235 00

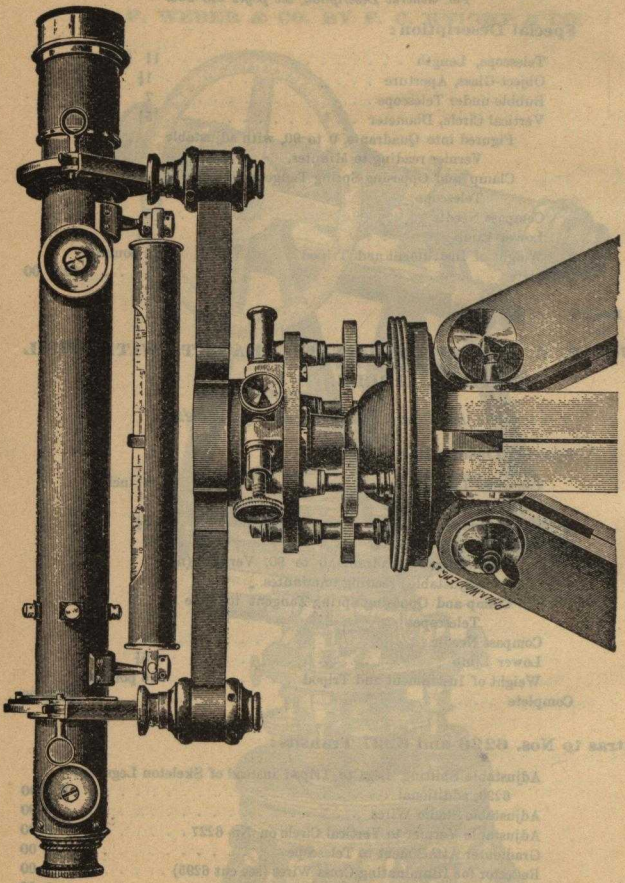
Extras to Nos. 6226 and 6227 Transits:

Adjustable Shifting Legs to Tripod instead of Skeleton Legs, cut 6290, additional	$ 5 00
Adjustable Stadia Wires	8 00
Adjustable Vernier to Vertical Circle on No. 6227	5 00
Gradieuter Attachment to Telescope	10 00
Reflector for Illuminating Cross Wires (see cut 6295)	4 00
Gossamer Waterproof Bag to protect Transit	1 00

DRAPER IMPROVED WYE LEVEL.

MANUFACTURED FOR

F. WEBER & CO. BY F. C. KNIGHT & CO.



6255, 6256, 6257

DRAPER IMPROVED WYE LEVEL.

Nos. 6255, 6256, 6257.

Has achromatic telescope of a power of 20, 22 and 24 diameters; with dust and rain-guard; sunshade to object-slide; object-glass 1¼ inch aperture; eye-piece has rack movement to focus cross-wires; spirit-level 6 inches long, vial of which is hand-ground and graduated, adjustable vertically and horizontally; wyes, collars on telescope and cross-bar are made of the best quality bell metal; wyes are provided with stops to readily set cross-wires horizontally and vertically; one wye is provided with adjustment for altitude; line of collimation true on all distances; object erect; has long centre; the upper part of instrument is not detachable from tripod above leveling screws; when packed in case, stands upright; legs of tripod solid, as shown in cut No. 6287, page 220; case, hand-polished, has strap and lock; provided with screw-driver and adjusting pin.

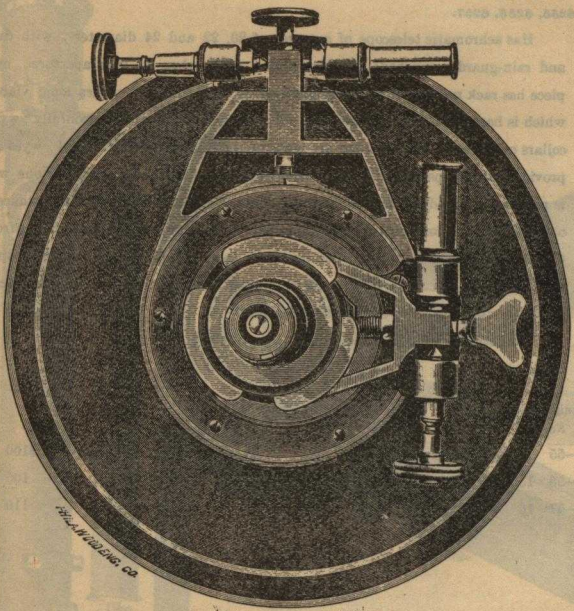
Weight of Instrument and Tripod, 16½ pounds.

Knight's No.		
6255—55	14-Inch Telescope . . . . . complete,	$100 00
6256—56	15 " " . . . . . "	105 00
6257—57	16 " " . . . . . "	110 00

Extras to Wye Level, Nos. 6255, 6256, 6257:

Skeleton Legs, instead of Solid Legs furnished, as shown in cut No. 6290, additional	1 50
Adjustable Stadia Wires	8 00
Gossamer Waterproof Bag to protect Instrument from rain or Dust,	1 00

IMPROVED
CLAMP AND TANGENT
ATTACHED TO THE
F. C. KNIGHT TRANSITS.



This Clamp is the invention of Mr. Knight and is the result of long and careful study and much experimenting on his part. In it he has accomplished the desired end—**A Perfect Clamp.**

This Clamp is attached to and clamps on the large flange of the centre, it has the largest clamping surface of any horizontal plate clamp constructed. It works entirely upon the centre, not affecting either the upper or lower limb. It works with greatest ease and accuracy, is sensitive to the touch of the tangent screw, yet rigid in holding instrument in position. The clamping and unclamping has positively no effect whatever on the long bubble or sight of the telescope. It is light in weight. In its construction we have added no additional weight to the instrument. The peculiar construction of this Clamp allows the upper and lower limbs to be joined together so closely that it is impossible for any dirt to get between them.

The tangent is on the right of the instrument and is made with a hard German silver, 50 threads to the inch, screw, working in a bronze metal nut. The opposing springs are made of phosphor bronze

DESCRIPTION OF

F. C. KNIGHT ENGINEERING TRANSITS.

The F. C. Knight Engineering Transits have achromatic telescopes, perfectly balanced, reverses at eye- and object-ends; dust- and rain-guard to slide; improved right and left movement to eye-piece, the focus cross-wires accurately; object erect; power of telescope 22 to 28 diameters; body of telescope is made of seamless drawn tubing; eye-piece to telescope is provided with slide to close when instrument is not in use; the axle is *made of the best bell metal* and fitted into grooved bearings in standard with adjustment for vertical plane of telescope; compass-needle has jeweled cap; all bubbles are ground; bubble under telescope is graduated; the plate bubbles are provided with guards; horizontal limb has two verniers, marked A and B, to avoid possibility of error when reading angles; the limb is figured with two rows of figures, one with quadrants 0 to 90, the other 0 to 360; the quadrants are lettered N. S. E. W., the same as compass; graduations are on *solid silver, not silver wash;* vernier openings are covered with French plate glass (sealed watertight); the glass is close to horizontal limb to prevent parallax in reading angles. Ivory reflectors are provided to opening of vernier.

The centres are compound, upper plate centre is 3¼ inches long, made of the best bell and bronze metal, not brass as is ordinarily used.

Clamps and tangent are of the new improved F. C. Knight pattern, see description on page 218.

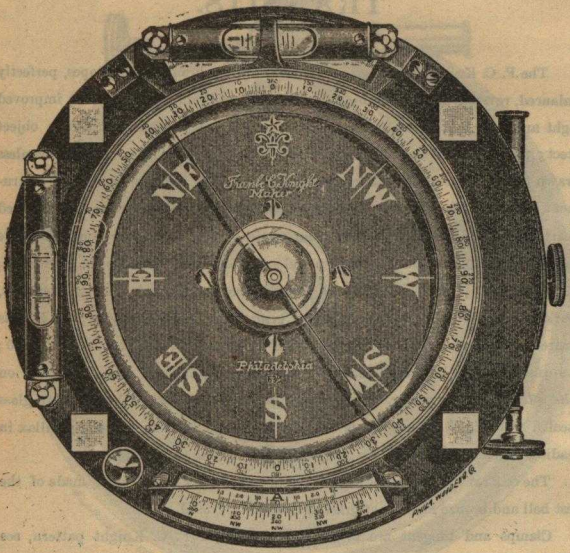
Tripod is provided with a shifting head for the accurate centring of instrument over point.

This instrument separates into three parts; the upper part of the instrument is detachable from the leveling screws, and the leveling screws from the tripod.

The tripod legs are of the skeleton pattern, as shown in cut No. 6287 on page 221. The instrument is packed separate from leveling screws in a hand-polished case, has strap and lock, is provided with reading glass, plumb-bob, two levers, and two screw-drivers (plain and forked).

The case has spring packing throughout to prevent injury to instruments in handling.

MAIN PLATE.



The above is a view of the Main Plate of the F. C. Knight Transit with the standards off, showing the positions of the verniers and plate levels, the compass ring and the way it is graduated, and its double row of figures, the inner row figured in quadrants 0 to 90, the outer row 0 to 360. The level over vernier B is so elevated as to give an unobstructed view of the vernier. The bubbles are graduated, the one over vernier B is protected by a guard; vernier A has an ivory reflector to throw additional light on vernier. You will note that the raising work of compass needle is so constructed as to allow no aperture for dust to enter the plate, as is usual with most transits.

TRIPODS.

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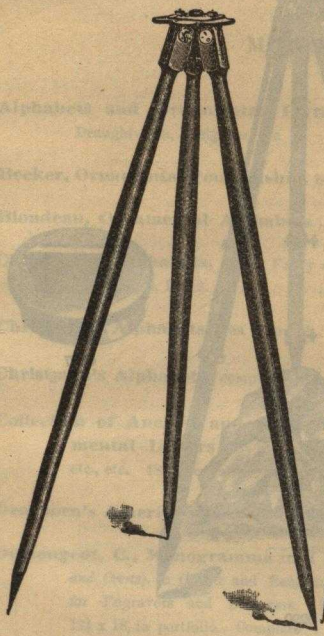
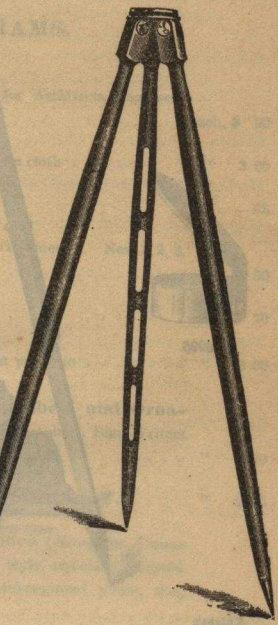


6285

This Tripod accompanies all Draper Instruments.



6287

This Tripod accompanies all F. C. Knight Instruments.

Knight's No.			
6285—101	Mahogany Solid Legs, with Head	per set,	$17 50
6286—101	" " " without Head	" "	7 50
6287—102	" Skeleton Legs, with "	" "	19 00
6288—102	" " " without Head	" "	9 00

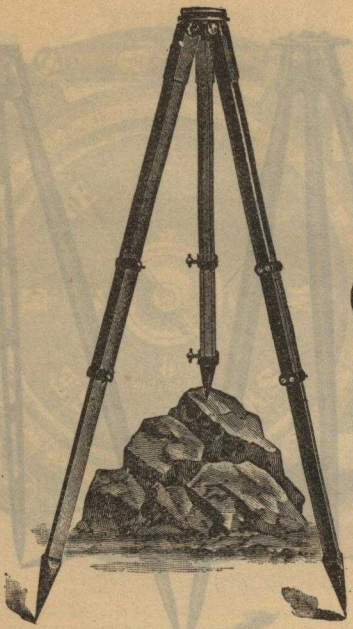
TRIPODS—Continued.

EXTENSION TRIPOD.

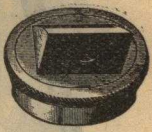
MANUFACTURED FOR

F. WEBER & CO. BY F. C. KNIGHT & CO.

6295



6290



6297

Knight's No.		
6290—103	Extension Tripod. Light, firm and strong, with an adjustment that can be quickly manipulated; has been in use for many years and has received universal commendation . . . . . each,	$20 00
	Three Extension Tripod Legs in place of Solid Legs, furnished with Draper Instrument, additional	6 50
	Three Extension Tripod Legs in place of Skeleton Legs, furnished with F. C. Knight Instrument, additional	5 00
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